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I.—*Sketch of the four Menangkabowe States, in the interior of the Malayan Peninsula. By Lieut. J. T. NEWBOLD, 23rd Regt. Madras Native Infantry.*

[See Proceedings of the Asiatic Society, 11th March, 1835.]

THE inhabitants of the states in the interior of the southerly part of the Malayan Peninsula, particularly those of *Súngie-újong*, or *Símú-jong*, *Rambowe*, *Johole*, and *Sríminánti*, derive their origin from the parent empire of *Menangkabowe*, in Sumatra, more directly, than the natives of the neighbouring states. This peculiarity, with respect to *Rambowe* alone, has been cursorily noticed by Mr. MARSDEN and Sir STAMFORD RAFFLES. The former, quoting the Transactions of the Batavian Society, observes, that the interior boundaries of the Malacca territory are “the mountains of *Rambowe*, inhabited by a Malayan people named *Menangkabowe*; and Mount Ophir, called by the natives *Ganong Ledáng*. These limits, say they, it is impracticable for an European to pass; the whole coast for some leagues from the sea being either a morass or impenetrable forest; and these natural difficulties are aggravated by the treacherous and blood-thirsty character of the natives.” If we give the author of this unpropitious account due credit for veracity, we must, in justice to the *Menangkabowes*, and the tract they inhabit, acknowledge at the same time that the progress of civilization has been rapid, and the change in the face of their country corresponding.

The forests are, at the present time, certainly thick, and some of the morasses deep; but during a recent ascent to the summit of Mount Ophir, and a journey along the foot of the *Rambowe* mountains, I found neither the one nor the other impenetrable or impracticable, and experienced nothing but kindness and hospitality from the natives.

Sir S. RAFFLES, in a letter to Mr. MARSDEN, thus notices the state of Rambowe : “ Inland of Malacca, about sixty miles, is situated the Malay kingdom of Rambowe, whose Sultán, and all the principal officers of state, hold their authority immediately from Menangkábowe, and have written commissions for their respective offices. This shews the extent of that ancient power, even now reduced as it must be in common with that of the Malay people in general. I had many opportunities of communicating with the natives of Rambowe, and they have clearly a peculiar dialect, resembling exactly what you mention of substituting the final *o* for *a*, as in the word *Ambo* for *Amba*. In fact, the dialect is called by the Malacca people the language of Menangkabowe.”

The foregoing remarks apply equally to the three vicinal states, Súngie-újong, Johole, and Sríminánti, and as has been already observed, to Náning. It is also worthy of remark, that in the ancient records of the Dutch, preserved in the archives of Malacca, the natives of Rambowe and Náning are invariably styled “ Menangkábowes.”

The period when these colonies, from the heart of Sumatra, settled in the interior of the peninsula, is unknown. It is generally admitted, that Singapore and the extremity of the Peninsula were peopled by a colony from Sumatra in the middle of the twelfth century, by the descendants of which Malacca was founded nearly a century subsequent ; as well as other places on the sea-coast, as Perak, Quedah, Pahang, Tringano, &c.

Autecedent to this, according to the best native information, the coasts of the peninsula and adjacent islands were inhabited, though thinly, by a savage race, still known under the name of *Ráyet Laut*, (subjects of the sea,) the Icthyophagi of the ancients, and termed by VALENTYN, probably from their situation, “ Cellátes.” The interior was peopled by those singular aborigines, the *Ráyet Utan*, (subjects of the forest,) of whom there are various tribes. Those that have hitherto fallen under my observation have all borne the Mongol stamp on their features ; though the *Sémang* in the interior of Quedah is said to be characterized by the woolly hair and thick lips, &c. of the Papúan.

Tradition ascribes the peopling of the interior of the peninsula by the Menangkábowes to a more recent and direct emigration from Sumatra than the one above alluded to. In absence of all historical information, the following story, as current among the better informed descendants of this colony, may perhaps not be out of place.

“ After SRI ISCANDER SHAH had fled from Singhapura to Malacca, in the seventh century of the Hejira, a Menangkabowe chief, named *Tá Pattair*, came over to Malacca attended by a numerous retinue.

He ascended the river to Naning, where he found no other inhabitants than the Jacoons, (a tribe of the *Ráyet Utan*), and settled at Taboo and took to wife one of the Jacoon damsels; an example speedily followed by his vassals. This little colony gradually spread itself over Súngie-újong, Rambowe, Johole, and other places, chiefly inhabited by the aborigines, (who gradually betook themselves to the woods and mountains, as the intruders encroached,) viz. Jompole, Sérling, Jellabú, Sríminánti, and Teráchi.

In course, of time, Tu Pattair died, and was buried at Lúbo Koppong, in Náning, where his tomb is to this day venerated as a *Krámet*. From these accounts then it would appear, that the present inhabitants of the interior of the part of the peninsula here spoken of, are chiefly descendants from the Menángxábowes and Jacoons; and those on its coasts, from the Malays who fled from Singhapura, and the *Ráyet Laut*.

The new settlers, rapidly increasing in numbers, divided themselves into nine petty states, under as many *Panghúlus* or chiefs, feudal to the Malayan Sultáns of Malacca, and after their expulsion by European powers, to those of Johore, by whom they were consolidated under the name of the *Négri Sambílan*, or the nine territories.

The names of these states, and the titles bestowed on their chiefs by the Sultáns of Johore, are as follow, viz. Segámet, under ORANG KAYU MU'DA; Johole, JOHAN LE'LAH PERCASSEH; Náning, Mahárájá LE'LAH; Súngie-újong, KLANA PU'TRA; Jellabú, AKHIR ZEMA'N; Rambowe, LE'LAH Mahárájá; Cálang or Salengore, TU'NKU CALANG, Ulu Paháng, including Serting and Jompole, Rájá ANDRA SEKA'RA, and Jellye, under Mahárájá PU'REA.

These titles were hereditary, and their possessors used to present themselves (Mengádap) once a year at the court of Johore.

In a manuscript collection of treaties made by the Dutch in the east, are found contracts principally of a friendly and commercial character, with Rambowe and the *Négri Sambílan*, from 1646 down to 1759. Prior to this period, the Dutch had assumed considerable influence over the nine *Négris*: and, with the formal consent of the king of Johore, Sultán ABDUL JALIL SHAH elected a Bugis prince, named DYEN CAMBODIA, as chief over the whole nine. Náning had long fallen into the hands of the European Government at Malacca, and Sríminánti rising into importance, tacitly assumed its place among the nine *Négris*.

The Menángxábowes, disgusted with the arbitrary proceedings of their Bugis ruler, invited over one of the princes of the blood royal of Menángxábowe from Sumatra, named Rájá MALAYWAR. The *Panghúlus* of Súngie-újong, Rambowe, Johole, and Sríminánti espoused

the cause of the latter, whilst the five remaining states took up arms in favor of the former.

The Dutch, it would appear from an official communication addressed to the Panghúlu of Náníng, in answer to a requisition made by that chief for ammunition to defend himself against the Bugis, did not take any active part in these disturbances, but pithily advised the *Panghúlu* to observe a state of neutrality, and in no case whatever to intermeddle with such intestine commotions; and refusing the supply of ammunition solicited, informed him that, being a subject of the Mátschappy, he had not the slightest cause for fear.

In the event, the Menangkábowe claimant, Rájá MALAYWAR, was successful, and DYEN CAMBODIA retired to Rhio, where he died about 1773.

The *Panghúlus* of the four states, which had espoused his cause, with the assent of the Sultán of Johore, and the government at Malacca, elected Rájá MALAYWAR as their sovereign, under the title of *Eang depertúan Besár**, renouncing at the same time their allegiance to Johore.

Rájá MALAYWAR was the first prince of the Menangkábowe dynasty in the interior.

The five other states remained as before, feudal to Johore.

The following stipulations, a copy of which is said to be in possession of the chief of Sríminánti, were then agreed on: viz. that the Menangkabowe sovereign, on all affairs of state, should assemble the four *Panghúlus*, and should submit to a majority; that his maintenance should be supplied equally by the inhabitants of the four states, each house contributing annually one gantam of rice, two cocoa-nuts, and one *súku*.

The *Panghúlus* bound themselves to furnish a certain complement of men, arms, ammunition, and provisions, in case of a war; also on occasions of deaths, marriages, circumcision, &c. in the royal family, to send, each of them, three head of buffaloes, and to distribute a certain sum in *sadkeh* (alms).

The instalment of the *Eang depertúan Besár* devolved upon the four *Panghúlus*, hence termed *Punghúlu Defántye*.

To them also, on the decease of their sovereign, fell the duty of transmitting the news of the event by letter to the Rájá of Menangkábowe, who on its receipt deputed one of the princes of his house, with pompous credentials†, viâ Siac, Malacca, and Náníng, to Ram-

* The title assumed by Menangkábowe princes of the blood.

† A translation of these credentials is annexed: they bear a strong resemblance to the Menangkábowe document published by Mr. MARSDEN.

bowe, where he was met and crowned in state by the four *Panghulu Defántye*. Hence Rambowe is termed *tánnah kréjan*.

From thence the newly elected prince proceeded to his *astánah*, or palace, at Sríminánti, which is the royal burial place, and also called *tánnah mengándong*.

Peculiar *Báleis* are elected by the *Panghulus* in their respective territories, for the reception of their feudal chief, the shape and fashion of which it would be deemed high treason, *Angkára Mahárújá Lélah*, to alter.

That at Súngie-újong is called *Bálei Melínátong*, from the circumstance of its being built at right angles with the river; and that at Johole, *Bálei Bertínkat*, having two stories.

The revenue of the four *Panghulus* is derived from the power they possess in the states under their sway, of inflicting fines and levying discretionary contributions, enforcing gratuitous labour, &c. The levying of the tenth on the crops is not in general usage.

The real power is monopolized by them, that possessed by the *Eang departúan Besár*, being only nominal, and depending on opinion.

On the decease of the first deputed prince, from Menáangkábowe, Rájá MALAYWAR, Rájá ADIL was nominated by his father, the reigning sovereign in Menangkabowe, as his successor; and having arrived at Rambowe, was there duly installed.

Rájá ADIL died in 1795 or 6, leaving three children, Rájá ASSIL, Rájá SABUN, and TUANKU PUTRI, a daughter. He was succeeded by Rájá ITAM, also deputed from Menáangkábowe; and Rájá ASSIL, eldest son of the deceased Rájá ADIL, became the first *Eang departúan Múda*. This innovation was made with the concurrence of the four *Panghulus*.

Rájá ITAM died in 1808, succeeded by Rájá LI'NGANG LAUT, who was the fourth deputed prince from Menáangkábowe.

In 1812, Rájá HADJI, one of the sons of the *Eang departúan Múda*, Rájá ASSIL, carried off by force his sister-in-law, in consequence of the *Panghulu* of Rambowe's refusing his consent to their marriage on the ground of its illegality. A war ensued, in which the *Eang departúan Múda*, Rájá ASSIL, who had sheltered the fugitive couple at Sríminánti, took an active and decided part in their defence against the *Panghulu* and *Ampat Súka* of Rambowe. The latter then sent to request the co-operation of Rájá ALI*. This notorious chief, whose life

* Rájá ALI is about 50 years of age, low in stature, dark in complexion, of a forbidding and rather ferocious aspect; negligent in dress and person; grossly ignorant and superstitious: though, for a full enjoyment of the drug opium, he would willingly relinquish his hopes of the *Jannat al Firdous*, in the seventh hea-

has been passed in feuds and bloodshed, and whose ambition has since elevated him to the dignity of the *Eang depertúan Besár*, was the son of the wife of the Menangkábowe prince Rájá ITAM, by her former husband, Rájá HAMAN, brother of Sultán IBRAHIM, late Rájá of Salengore. Rájá ALI's mother is the daughter of the second deputed prince from Menangkábowe.

Rájá ALI, who had fled to a place called Súngie Nípah, beyond Cape Rachado in Salengore, lent a ready ear to this proposition, and repaired to Rambowe, accompanied and supported by the *Dattu Múda* of Lingie. His weight turned the scale of events, and the *Eang depertúan Múda*, Rájá ASSIL, after some fruitful efforts at negotiation, retired to Náning (1813), and eventually to Malacca (1814), where he appealed to the then British Resident, Colonel FARQUHAR; nothing however favorable to his cause resulted.

Having obtained a private loan of 2,000 dollars in Malacca, he again proceeded to Rambowe, but failing, retreated to Náning, where he died shortly afterwards (1814-15); and was interred at the green knoll on which stood the mosque of Búkit Tútú, near Alor Gájeh.

He left four sons and two daughters.

Rájá ALI, this obstacle to his ambition being removed, was elected as *Eang depertúan Múda*, under the *Eang depertúan Besár* LINGANG LAUT who died in 1824, leaving two sons, Rájá RADIN, of *Sríminánti* and Rájá U'JONG; both by his wife, the daughter of the Rájá of Jillabú.

In consequence of intrigues and dissensions among the four elective chiefs, artfully fomented by Rájá ALI, a successor was not appointed until 1826, when Rájá LABU, a son of the Rájá of Menangkábowe, bearing the ancient credentials from his father, and a letter from the chief of Siac, arrived.

He was preceded by an adherent named Rájá KRE'JAN, and having presented his documents at Malacca, went up to Náning. From thence, escorted by the chief of that place, the present *ex-Panghúlu*, he repaired to Rambowe, where he was installed according to custom. He married with TUANKU ITAM, daughter of the late *Túan Múda*, Rájá ASSIL, and proceeded to his *astánah* in *Sríminánti*.

ven, with all its black-eyed hourís. In disposition, he is crafty and determined; taciturn and deliberate in council; but prompt and decided in action—qualities of which I had opportunities of judging during a recent struggle between the Rambowe and Lingie chiefs. These, added to his high connexions, which however were not sufficient to give him a lawful title to the eminence which he has attained, mainly contributed to his success.

In 1830, in consequence of his countenancing the licentious proceedings of his follower, Rájá KRE'JAN, and the intrigues of his wife; and above all from the ambitious machinations of Rájá ALI, he was compelled to quit Sríminánti, but shortly afterwards, having gained over to his cause three out of the four elective *Panghulus*, viz. those of Johole, Sríminánti, and Súngie-újong, as also the chief of Jompole, besieged Rájá ALI, in his mud fort of Bander in Rambowe.

Rájá ALI held out resolutely against the formidable confederacy; till at length, through the pacific mediation of the *Panghulu* of Naning, after having lost one of their principal leaders, who was killed by a cannon shot from one of the old iron guns on the fort, they withdrew their vassals, and retired to their respective states.

Rájá ALI, his son-in-law, SYED SABAN, and Rájá RADIN, of Sríminánti, shortly after this seized on an opportunity afforded them by the absence of the *Eang depertúan Besár* at Súngie-újong, of surprising Sríminánti, and repossessing themselves of the guns which Rájá LABU had formerly taken from RADIN, under the pretext of their forming part of his regalia (*Kabesáran*.)

When tidings of this reached Rájá LABU, he marched, supported by the *Panghulu* of Súngie-újong, KLANA KAWAL, against Rambowe; but in consequence, it is said, of some horrid cruelties perpetrated upon a female by some of their followers, they were deserted nearly to a man.

Rájá LABU did not advance further than Náuning: whence, after a short stay, he went down to Malacca, and finally, in 1832, recrossed the Straits to Sumatra. His adherent, Rájá KREJAN, fled to Paháng, and thence to Múar, and finally, to Johole, where he is now engaged in fruitless intrigues.

He assisted the *ex-Panghulu* of Naning during his rebellion against Government.

Such is the origin and decline of the Menánkábowe dynasty in the interior of the peninsula.

Rájá ALI was elected as the *Eang depertúan Besár* over the four states, and his son-in-law, SHERIF SYED SAABAN, as *Eang depertúan Múda* of Rambowe at Bander, on the 13th September, 1832.

The question of succession still remains unsettled: among the elective *Panghulus*, great discordance of opinion prevails, arising principally from the premature and impolitic revival of old but contested rights appertaining to their titles by Rájá ALI and SYED SAABAN. This has led to rebellion, and the strangulation of the tin trade in Súngie-újong; and to bloodshed and disturbances on the banks of the Lingie river, unadjusted at the present moment.

An innate antipathy to innovation, and a secret wish to revert to the Menangkábowe dynasty, prevails more or less throughout the four states, and in case of the demise of Rájá ALI, if not previously, a severe struggle may be expected between the partizans of the *Eang departúan Muda*, SYAD SAABAN, on the one hand, and the advocates for the *addat dhaulu*, or ancient custom, on the other.

SYED SAABAN, by no means insensible that in this case, the best way to secure an advantageous peace is to prepare betimes and vigorously for war, has been for some time past actively engaged in strengthening Sémpang, a post advantageously situated on the apex of the delta, formed by the junction of the Lingie and Rambowe streams, and about six miles from their debouchément into the sea. Here he has lately been joined by a chief from Sumatra, with a numerous train of followers.

APPENDIX.

Translation of the Credentials called the Tromba Menangkábowe تورمبا مننگابو brought over from Sumatra by the last deputed prince Rájá LAB'U.

The seals at the top are placed from the right to left, according to the order of precedence of the princes whose titles they bear; all feudal to Menangkábowe.

According to the etiquette of Malay letter writing, the "place of honour," for the impression of the seal, is about the commencement of the epistle, to its extreme right, and on the highest *Mistar*. In letters from a subject to a sovereign, the impression is made near the foot.

6	5	4	3	2	1
Sultán Rája Magat, from Rogum, son of the Eang de- pertúan of Paggara- yong.	Sultán Berkunbah Puteh, from Sungie Pa- ku, the son of, &c.	Sultán of Indraghiri, Sulta'n Sri Kahil, son of, &c.	Sulta'n of Jambie, entitled Bag- hinda Tuan, son of, &c.	Sultan of Palembang, son of Sulta n Indra Rahim, son of, &c.	The firm in faith, by the grace of Allah, the great Sul- tan Mahárajá' dhirajá, son of the deceased, Sulta'n Abdul Jalil Mua'z- zem.
11	10	9	8	7	
Sulta'n Tuanku of Siac, son of, &c.	Sulta'n of Buntan, entitled Sulta'n Mohikat, son of, &c.	Sulta'n of Achin, entitled Sri Paduka Berpa- kat Rahim, son of, &c.	Sulta'n of Priamah, entitled Ma- ha raja' son of, &c.	Sulta'n of Indra pu- ra, entitled Sul- ta n Mahomed Shah, son of, &c.	The firm in faith, by the grace of Alla'h, the great Sul- ta'n Maha'raja' dhiraja', son of the deceased Sulta'n Abdul Jalil Mua'z- zem.

2. Sultán Indrá Rahim was the first monarch of Palembang, and grand-father of the Eang departúan Makat Denam, brother of Baghinda Abras.

3. Baghinda Tuan was the founder of the dynasty of Jambie, which extends to Chi Jambie, of nine districts.

4. Sultán Sri Kahil was the founder of the dynasty of Indrághiri, which extends to the sea.

5. Sultán Berkumpa Puteh was the founder of the dynasty of Sungie Pakú, which extends to Bandar Sapuloh.

6. Rájá Magat was the founder of the dynasty of Rogum, which extends to Kúri, in the Mampawa territory.

7. Sultán Mahomed Sháh was the founder of the dynasty of Indrápurá, which extends to Moco Moco.

8. Sultán Mahárájá was the founder of the dynasty of Priáman, which extends to Tiko and Kakanuli.

9. Sri Paduka Berpakat was the founder of the dynasty of Achin, which extends to Telabu and Battu Barra.

10. Sultán Mohíkat was the founder of the dynasty of Bintan, extending to Batavia.

11. Sultán Suanku was the founder of the dynasty of Siac, which extends to Patta Pahan, to Pulo Sawan, and Kasang Bunga.

“ Oh God, look down upon the greatest of Sultáns, prince of great men, the shadow of Allah in this world, renowned among Arabs and barbarians inhabiting this material world, (created for) the children of Adam : Oh Lord of the kings of the earth, it hath been declared in the Korán that every day and night is to be accounted as void of light, until the dawning of the true faith in the appearance of MUHAMMED SEYD-AL-MURSALIN, the last of the prophets. Amin ! Oh God of worlds.

The Almighty hath caused this firman to appear in the Korán in respect to princes, viz. “ I have created man infinitely superior to the angels, the sun and the moon. I have given him sovereignty on earth. I have created genii and mankind, in order that they may worship me.”

The Almighty caused the dry land called Púlo Langkáwi to descend between Palémbang and Jambie, as the place of residence for the original sovereigns of the world, viz. the descendants of Sultan HIDAÏET ALLAH TA-ALA, whom he had brought down from the clouds.

Among these descendants was Rájá ISCANDER zer Alkurnein, whose country is Srang, and who is possessor of the iron lock intensely green ; sometimes assuming a red, sometimes a yellow, and sometimes a white hue ; and, in short, possessing all colours so vividly as to dazzle the eye of the beholder ; this forms part of the *kabesáran* (regalia) of the three royal brothers, who scatter profusely their justice and munificence to all the slaves of Allah, and to all princes who are feudal to them and derive favor and advancement from the beloved of Allah, MUHAMMED. These three Sultáns were very wise and faithful protectors of all the slaves of Allah.

It hath been declared that the fountain in paradise, *Jannat unnahim*, causes the young shoots to spring up from within the earth ; in like manner, the slaves of Allah exist by inhaling the fragrant odours emanating from the glorious *Bálie* (a sort of hall of audience) of their prince.

Odoriferous as ambergris and musk are the prosperity and power of the three royal brothers, viz. the Sultán of Rúm, Sri Mahárájá

ALIF, the Sultán of China, Sri Maharájá DEFANG, and the Sultán of the Golden Island, in the territory of Menangkabowe, Sri Maharájá dhi Rájá BERDOULET. Amin, Oh God of worlds!

Whereas the following are declared to compose the *kabesáran* (regalia) of his majesty the lord of the state of Menangkábowe, viz. the diadem of the prophet SOLOMON: the web called *Songsang kála*, which weaves itself, a thread every year, until the completion of the duration of the world. The wood *Káyu Gámet*, which is divided into three portions, one of which is in the possession of the King of Rúm, the other in that of the King of China, while the third remains with the King of Menangkabowe. Theratan termed *Mánnó ghiri*, which erects itself. The *Párang* (chopper) of gold. The *Chongka Chongkye* (a tray with a pedestal). The mass* of gold, *Kédah Allah*, (lit. the tinder box of Allah,) resembling a man in shape. The gold *Juttah Jattí*, to be suspended across his shoulder. The tree *Naga† Tárin*, studded over with precious stones and rubies. The *Sépit‡ Pinang*, (betel-cutter,) *Kapála bára*, which performs its office spontaneously. The *Choie Siméndang ghriş*, with one hundred and ninety notches, occasioned by the wounds it inflicted on the serpent *Sicatimána*. The mountain *Bongsyé*, from whence the Sultán ascends to the fiery mountain, and by whose supernatural influence the rivers which flow from it possess rocks of gold, and waters emitting odours delicious as those of flowers. The lance whose shaft is of the *Sággar sántan*. The spear called *Sambúrah*, with a sheath of *Gárda* wood, on which is inscribed a passage from the Korán. The kus *Allang bára*. The mat composed of *Sálang* leaves, which is worn as an ornament to the head by Mahá RA'TE, but forbidden by Mahá RUN-JUT, who were cotemporary with the origin of this country.

The elephant *Sacte*. The fresh-water sea extending a day's sail. The mountain emitting flames of its own accord, where grow the plaintive bambus, which entrap wild birds by the fascination of their melody. The petrified cotton. The *Gúndang Valigúri* (a sort of drum). The *Gong jejátan*. The *Gong seméndrang*, the sound of which reaches to the clouds.

* This mass of gold, according to the information of a native of Manangkabowe, was what remained after the making of the crown of one of the ancient princes of that empire.

† The *Naga Tárin* is supposed to be a tree transmuted into gold.

‡ This instrument is said to be endowed with the faculty of ascending the Areca trees, and cutting the nut without human assistance.

§ Vide *Sejára Maláyu* for an account of the combat which terminated by the serpent's being cut into three parts by the invincible sword of Sangsapurba, traditionally the descendant of ALEXANDER the Great, and founder of the dynasty of Menangkábowe.

The hall of audience *Bálie*, whose columns are of the *Selátang* (a species of lofty nettle), and the beams of *Lendang* root. The drum *Pállut pulut*, headed with the skins of lice. The horse *Sambaráni**.

The bell *Samédro Sámbang háte*, whose perfect sound from the left daily summons petitioners to the right of the imperial throne.

The buffalo *Sibénoang Sácti*. The cock *Bírang Sangunáni*. The well *Sikatang*. The cocoanut *Nira Bálie*. The black *Sanghúdi*, which is produced spontaneously. The paddi, *Sitanjo Báni*, on which his majesty the Eang depertúan feeds at mid-day. The paddi called *Sarámpun déndam kamára*. The flower *Srí*, the odour of which extends a day's journey; it is sown, grows up, produces leaves, flowers and brings forth fruit in the space of a single day, and the azure *Chumpaka*.

Such form the *Sabesáran* of the *Eang depertúan* of Menánkábowe, the Sultán who reposes cradled in the east, and on whose arising from slumber the *noubet* is sounded. The Caliph of Allah, his majesty the *Eang depertúan Sáti*.

These are the credentials of the beloved grandson of the *Eang depertúan* of Paggarúyong.

The bearer of this friendly document must be assisted and well entreated both by sea and land whenever encountered; for the High God hath said, "First set your trust on me, next on MUHAMMED and doubt not."

Do ye, therefore, all our children and grand-children, noblemen, merchants, and nakhodas, agree in standing by and upholding our ancient usages, which have been handed down by our forefathers,

Should this document be brought to Síac, Níla láwan or Patápaán, to Campar kíri or Campar kánan, molest not the bearer by sea or by land. These injunctions extend to Palémbang, Indraghiri, to Rogum, to the villages and forests of Tambusai, to Battu Bara, to Pulo Penang, to Malacca, Qèdah, Java, Batavia, Susu, Telabúah, Guttar, and Bencoolen, which is subject to the Company, together with other places on the west coast of *Pulo Andáús*.

Let us all, therefore, to the utmost of our power, place firm confidence in the great and glorious God, according to our solemn oaths, and the oath "*Bisa Gawye*" of our ancestors.

Should any person therefore molest the bearer of these, he shall draw down on himself the ban of the *Eang depertúan* of Paggarúyong; his crops shall fail, and his subjects shall not thrive; but on the other

* The Sambaráni سمبراني is a fabulous horse, celebrated in Malay romance, generally said to be winged.

hand, whoever receives the bearer with kindness, shall be rewarded with abundant harvests, and increase of subjects, and whithersoever he may go and settle, prosperity shall attend him, whether on the coast of the Island of *Pálo Pércha* or any other place by sea or by land.

Oh Lord of lords and Helper of helpers, the most wise God."

II.—*Comparison of the Heights of the Barometer, with the Distance of the Moon from the Celestial Equator.* By the Rev. R. EVEREST.

[See Proceedings of the Asiatic Society, 6th May, 1835.]

In my last paper, I shewed, that on an average of ten rainy seasons, the daily amount of Rain-fall diminished, as the declination of the moon increased, until it reached between 10° and 15° ; but that after that distance, the reverse took place, and the amount of Rain-fall increased as the declination increased. The general average of the 10 years for every 5° distance from the Equator gave the following results:

Declination	0°	5°	10°	15°	20°	25°	from the Equator.
Inches of Rain	.321	.271	.256	.259	.347		



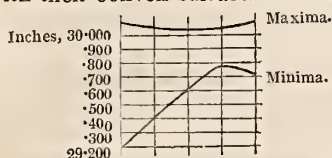
It was but natural to suppose, that the height of the Barometer would vary in a similar manner, or rather the reverse, i. e. as the one increased, the other would diminish, and vice versa—with this expectation, I made a Table of the heights of the Barometer, as I had before done of the Rain-fall. The 4 p. m. observations were selected from the Registers, as being nearest the time of noon at Greenwich, when the declination of the moon was taken; but I did not at first obtain results so satisfactory as I had expected. On taking the general average of the 10 years, a considerable depression (as much as .040 in.) appeared, when the declination was greater than 20° ; but from that to the equator, the heights were irregular, and nearly on a level. But in examining the Registers, for the purpose of making out the tables, I could not help observing, that though all the greatest depressions coincided (or nearly so) with the times of the moon's maximum declination, yet that many of the greatest elevations held a similar situation. The inference of course was, that a principle of compensation was somehow or other at work. I now became acquainted with the opinion of an eminent philosopher, that any elevation of the barometer in southern latitudes must have the effect of producing an equal depression in a corresponding northern latitude. If we only generalize this assertion a little, and say, "that any de-

pression in any particular spot must have the effect of producing an elevation somewhere else," then, we may see why in any one place (taking the year throughout) the maximum elevations and minimum depressions on the same days of the moon's courses coincide, &c. But it is straying from the subject, to attempt to reason upon phenomena, while we are as yet only in the threshold of our inquiry.

In pursuance of the idea I have above mentioned, I next took the maximum elevation that occurred in each successive division of 5° of the moon's distance from the equator in each year, and then took the general average of the whole 10 years. I did the same with the minima, and obtained the following General Average.

	Declination	20°	15°	10°	5°	0°	Equator.
Bar. max. inches	30.032	.033	.026	.026	.022		
Do. minima, ..	29.236	.313	.355	.379	.375		

These two series of numbers would very nearly form two curves, with their convex surfaces to each other, thus :



[We are sorry to perceive that the diagram which was copied from the rough sketch in the MS. without advertence to the text, does not faithfully represent the figured statement; but the author's intention will be easily understood.—ED.]

I will now leave this part of my subject, as I shortly expect some further Registers and Nautical Almanacks for comparison, and I will hereafter revert to it more in detail, and make out a Table more at length, shewing the results of each year. I have brought it forward now somewhat prematurely, because from sickness and consequent removal from home, my labours must be suspended for some months, and I am desirous before that happens, to bring forward the following note, which I humbly hope may not be without its use to a large and important class of the community. This was the end which I proposed to myself in commencing a long and laborious investigation, and, if I attain it, in any degree, my purpose will have been more or less answered.

NOTE.

Shewing, that the greatest depressions of the Barometer do not, (as some have conjectured,) coincide with the days of conjunction and opposition of the moon, neither with the days of her perigee, but that they coincide, or nearly so, with the days of her maximum monthly declination.

For Example.

In the ten* years of which the barometrical daily changes have been re-

* The ten years alluded to are: 1823, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834.

gistered at Calcutta, there are (6) *six* instances in which the barometer has fallen below the height of 29·200 inches.—I here add the dates of each instance, with the heights of barometer and declination of moon three days before, and three days after; also the day of nearest new or full moon. The hour of 4 P. M. has been chosen, as corresponding better than any other to the hour of noon at Greenwich, at which time the declination of the moon was taken.

1823.	Bar.	Inches.	Moon's	Note.—The real max. on 15th, at midnight, 26° 16'.
August.	4 P. M.	Rain.	Dec.	
5th, noon, Perigee.			0 /	
6th, nearest.				
12th,.....	29·321	..	18 29 S.	
13th,.....	·313	..	22 8	
14th,.....	·276	..	24 41	
15th,.....	·180	0·52	26 3	
16th,.....	·388	3·32	26 12	
17th,.....	..	2·56	25 9	
18th,.....	·526	3·00	22 59	

1829. June, 21st, noon, Perigee. 30 days, 16 hours, new moon.			0 /
27th,.....	29·185	6·20	14 13 N.
28th,.....	·407	..	16 34
29th,.....	·491	..	18 0
30th,.....	·474	..	18 27
July.			
1st,.....	·454	0·16	17 55
18th, midnight, Perigee.			
30 days, 5 hours, new moon.			
26th,.....	29·421	..	17 36 N.
27th,.....	·382	..	18 20
28th,.....	·298	0·72	18 6
29th,.....	·159	0·28	17 0
30th,.....	·301	0·58	15 6
31st,.....	·445	0·15	12 33

The declination at noon, 27th, is, 18° 20' 5", and the declination, 27th, at midnight, is, 18° 20' 22", so that the real maximum is within 1 day, 12 hours of the depression of Barometer.

1833. May, 24th, noon, Perigee. 19 days, 1 hour, new moon.

	Barometer.	Rain.	Moon's Dec.
19th,.....	29·500	..	15 49 N.
20th,.....	·376	0·98	19 11
21st,.....	28·868	2·90	21 30
22nd,.....	29·300	5·34	22 32
23rd,.....	·425	..	22 7
24th,.....	·340	..	20 7

The real maximum declination is 22 days, 6 hours, Greenwich time.

1830. May, 20th, midnight, Perigee. 21 days, 19 hours, new moon.

	Barometer.	Rain.	Moon's Declination.
	4 P. M.	Inches.	
21st,.....	29·452	..	13° 5' N.
22nd,.....	·514	..	16 4
23rd,.....	·487	..	17 56
24th,.....	·427	0·10	18 36*
25th,.....	·306	3·00	18 7
26th,.....	·107	4·22	16 36
27th,.....	·434	..	14 15
28th,.....	·444	..	11 18
29th,.....	·521	..	7 55

Note.—The greatest depression of barometer occurred at noon on the 26th,

when it stood at 29·008, and reducing this to the level of 4 p. m., by subtracting (·087), the average monthly difference between noon and 4 p. m., there is left 28·921 inches for the theoretical height of Barometer at that time. Noon 26th is, of course, by Greenwich time, 25 days, 18 hours, nearly.

1834. August 7th, midnight, Perigee. 4 days, 18 hours, new moon.

	Barometer.	Rain.	Moon's Dec.
1st,	29·178	..	22° 40' N.
2nd,	·110	2·20	24 6
3rd,	28·820	4·10	24 11
4th,	29·344	0·70	22 47
5th,	·368	..	19 55

The real maximum is on the 2nd, nearly at midnight, or 2 days, 13 hours, Greenwich time.

The Perigee is evidently out of the question. The comparison between the time of conjunction, and that of moon's maximum declination, with the barometric minimum, may be more clearly stated in a table, shewing the distance of each of the former in days and quarters of days from the latter, thus :

	Time of moon's maximum declination.		Distance of Time of new moon.		
	Days.	Qrs.	Days.	Qrs.	
1823, Aug. 15th,	0	2	7	0	} From the nearest ba- rometric mi- nimum.
1829, June 27th,	3	0	3	3	
1829, July 29th,	1	2	1	1	
1830, May 26th,	1	3	4	0	
1833, May 21st,	1	1	2	0	
1834, Aug. 3rd,	0	2	1	3	

Making the same allowance as is done in the case of the tides, viz. three days before, or three days after the event, for a coincidence; all these instances of moon's maximum declination may be considered as coincidences with their respective barometric depressions : it is evident, that the times of conjunction cannot be so considered. We must observe that the only instance of great separation between the time of moon's maximum declination and the barometric depression, was in 1829, when the maximum declination of moon was at its least (not above 18° 20'), and consequently only faintly felt.

It now only remains for us to notice the minor barometric depressions, which have occurred during the same period, and we will first take the minima of the years which were above 29·200 inches. From the increase of rain, which occurs when the moon gets within 10 degrees of the equator, we might have supposed that the next lowest depressions would probably be found there—and this turns out to be the case. I here subjoin the details.

	Barometer.	Rain.	Moon's
1827.	4 P. M.	Inches.	Declination.
June.	29·314	..	9 40 N.
28th,	·222	4·40	5 45
29th,	·207	3·72	1 31 N.
July.			
1st,	·390	0·38	2 51 S.

Nearest new moon, June, 23 days, 22 hours; say 24 days, or 7 days' distance from the depression.

	Barometer.	Rain.	Moon's
1832.	4 P. M.	Inches.	Declination.
October.			
5th,	29·763	..	15 51 S.
6th,	·688	1·71	12 31
7th,	·201	3·54	8 34
8th,	·696	1·65	4 11 S.
9th,	·697	..	0 28 N.

Nearest full moon, 9 days, 7 hours ; or 2 days, 7 hours' distance from the depression.

The minimum depressions of the remaining years are still higher, and irregularly placed with regard to the moon's declination, as follows:

1826.	Barometer.	Rain.	Moon's Declination.
July.	4 P. M.		
27th,.....	29·317	..	16 40 N.
28th,.....	·290	..	19 5
29th,.....	·313	0·06	20 41
30th,.....	·361	1·08	21 22
31st,.....	·487	..	21 3

Nearest new moon, August, 3 days, 7 hours ; or 6 days, 7 hours' distance from the depression.

1828.	Barometer.	Rain.	Moon's Declination.
July.	4 P. M.		
21st,.....	29·373	1·07	14 17 S.
22nd,.....	·352	0·12	16 47
23rd,.....	·352	0·08	18 22
24th,.....	·394	0·84	18 48
25th,.....	·451	0·78	17 58

Nearest full moon, 26 days, 10 hours ; or 3 days, 10 hours' distance from the depression.

1831.	Barometer.	Rain.	Moon's Declination.
July.			
22nd,.....	29·496	0·12	19 26 S.
23rd,.....	·492	..	19 31
24th,.....	·546	1·35	18 40
25th,.....	·451	..	16 55
26th,.....	·379	0·38	14 19
27th,.....	·291	..	11 0
28th,.....	·302	0·25	7 6

Maximum declination, 4 days' distance from depression.

Nearest full moon, 24^h 9', or nearly 2½ days, distance from depression.

There are yet some further minor depressions, which we must not omit, as though they are not the minima of any particular years, they are much lower than some of those we have been considering. I subjoin the details of all under 29·300 inches.

1823.	Bar.	Rain.	Moon's Decl.	1823.	Bar.	Rain.	Moon's Decl.
June.				July.			
8th, ..	29·403	Unknown,	25 47 S.	16th, ..	29·282	Unknown.	19 43 S.
9th, ..	·430	..	26 12	17th, ..	·255	..	23 0
10th, ..	·359	..	24 41	18th, ..	·311	..	25 13
11th, ..	·267	..	21 25	19th, ..	·353	..	26 15
12th, ..	·274	..	16 48	20th, ..	·355	..	26 4

Nearest new moon, 8th.

Full moon, 22nd.

1827.	Bar.	Moon's Decl.	1827.	Bar.	Moon's Decl.
June.			July.		
17th,	29·391	6 18 N.	16th,	29·271	12 33
18th,	·245	10 12	17th,	·259	15 33
19th,	·252	13 36	18th,	·313	17 49
20th,	·404	16 22	19th,	·312	19 18
21st,	·459	18 25	20th,	·331	19 55
22nd,	·509	19 39	21st,	·396	19 41
23rd,	·473	20 2	Rain 1·66.		
24th,	·486	19 31			

Declination at time of depression,
10° 12'. Rain, 1·90.

	Bar.	Moon's Decl.		Bar.	Moon's Decl.
1829, June.		° '	1832, July.		° '
3rd,	•314	18 20	26th,	29•360	20 50
4th,	29•292	17 28	27th,	•302	19 26
5th,	•253	15 45	28th,	•296	16 39
6th,	•494	13 21	29th,	•371	12 48
Rain, 2•18.			Rain, 0•87.		

	Bar.	Moon's Decl.		Bar.	Moon's Decl.
1834, June.		° '	1834, July.		° '
19th,	29•287	18 53 S.	24th,	29•398	11 1 S.
20th,	•230	22 4	25th,	•298	6 22
21st,	•342	23 53	26th,	•370	1 32
22nd,	•418	24 16	Rain 0•75.		
23rd,	•472	23 15			

*Summary of Depressions.**Remarks.*

- 6, greatest, (all below 29•200.) In one instance only, 3 days between time of dep. and max. decl.
- 2, lesser, .. (between 29•200 and 29•220.) Both within 10° of equator.
- 10, least, .. (between 29•220 and 29•300.) Of which, in six instances, the time between maximum declination and depression is not more than two days; in one instance, three days; in one instance, moon's declination was less than 10°; two instances, irregular; one, 12' more than 10° from the equator; one (•291), of four days' distance between time of depression and maximum declination. I must now end this paper, begging permission to resume the subject, as I may find opportunity to do so.

ROBERT EVEREST.

It may not be deemed out of place to notice here the amount of wind and rain, which accompanied each depression. In five cases out of the six, a depth of rain of from 6½ to 9 inches was deposited within three days of the depression. In 1823, no notice is taken of the wind in the Register, but the Kedgerie report states, "light airs" on August 15th, (the day of the depression,) and "hard gales from southward and eastward" on the (16th), the day after. The Gazette laments inundations in the upper parts of Bengal, loss of life, villages swept away, and devastation of the crops. In June, 1829, the Register notes on the day of depression "violent wind all night, with thunder and lightning." In May, 1830, and May, 1833, were violent storms or hurricanes, the effects of which must be yet remembered by most of us. In August, 1834, was a heavy gale of wind. In July, 1829, alone, neither the quantity of wind nor of rain appears to have been great. The former is not noticed, the latter was less than 1•75 inches. We may remark too, that in the first instance alone, viz. that of August 15th, 1823, was the declination of the moon south. The rest have all occurred between the 20th May and 4th August, or from 31 days before the summer solstice, to 44 days after it.

III.—*Collimation Error of Astronomical Instruments.* By J. G. TAYLOR,
Esq. *H. C. Astronomer, Madras.*

Ten years have now elapsed since Captain KATER's plan for determining the position of the line of collimation by means of a floating collimator was brought before the public, and his ingenuity rewarded by the gold medal of the Royal Astronomical Society. It has happened, however, with this, as with many other great and good inventions, which are true in theory, that the application to practice is attended with so much uncertainty, as almost completely to render the plan unavailable; hence it is, that the results of observations made with the assistance of the floating collimator (if any there be) have never yet been made public. I offer these remarks with a view of saving the amateur astronomer from the vexatious disappointments which he may expect to meet with in the employment of the floating collimator; and, at the same time, of offering a plan to supersede its use, which is totally free from any sort of uncertainty: and can, moreover, be applied with much greater facility than the floating collimator; the plan in question consists of *making the telescope a collimator to itself*, by viewing the *image* of the wires reflected from a basin of quicksilver, at the *same time* that the direct image is viewed in the ordinary way through the eye-piece; to accomplish this, it is only necessary to exhibit a bright light behind the wires, so as not to interfere with the eye of the observer when applied to the eye-piece—in the case of the Madras Mural Circle, to which this principle was lately applied, I introduced a plain silver speculum into the eye-piece of the telescope between the eye-glass and the wires, having its polished surface directed towards the wires; the speculum was suspended in the cell of the eye-piece by two screws, allowing it to revolve on them as an axis, and was furnished with a small hole in the centre, through which the wires in the telescope could be seen; the telescope being now directed to the nadir to a basin of quicksilver, the speculum was turned on its axis until a ray of light (admitted through a hole about $\frac{1}{15}$ of an inch diameter, drilled in the side of the telescope), was reflected from it, and made to fall perpendicularly upon the wires (an operation occupying about five minutes to adjust, and not afterwards requiring alteration), by this means, in addition to the ordinary direct image of the horizontal wire, a reflected image was obtained, situated as much to the north of the nadir as the other was to the south, and vice versâ; nothing more was necessary now than to clamp the circle and bring the wire to cover its reflected image by the tangent screw, when the reading gave (the circle being adapted to measure north polar distance) $180^{\circ} + \text{colat.} + E$; subtracting the two former or $256^{\circ} 55' 50'' E.$, the error of collimation, became known. Since establishing the above mode of observation, which I

propose to call the *reflecting collimator*, the error of collimation (or index error as it is generally called) has been read off five times every day, viz. at 6 A. M., at noon, at 6 P. M., at 8 P. M., and at midnight ; taking the mean of these, the error of observation is necessarily very small, and the effect of any accidental difference of temperature in the room, which might alter the figure of the circle at any one time of the day, is at the same time greatly diminished.

To shew to what extent this mechanical measure, as it may be termed, can be depended upon, I here subjoin the result of the last ten days' observation compared with the index error determined by astronomical means, thus :

INDEX ERROR OF THE MADRAS MURAL CIRCLE.						
By the Reflecting Collimator.			By Astronomical Observation.			
	No. of Obs.	Index Error.	No. of Obs.	Index Error.	Difference.	
1835						
Feb.	21	5	—2·27·36	6	—2·27·39	0·03
	22	5	27·92	8	27·73	0·19
	23	5	27·64	9	27·45	0·19
	24	5	26·46	7	26·74	0·28
	25	5	27·50	7	26·50	1·00
	26	5	27·22	6	27·34	0·12
	27	5	27·28	9	27·10	0·18
	28	5	26·80	8	27·54	0·74
March,	1	5	26·91	9	27·31	0·40
	2	5	26·83	9	27·54	0·71

As a further proof of the efficiency of the reflecting collimator, I may adduce the result of observations made at this observatory with the transit instrument. Here we read off twice the sum of the errors of level and collimation, either of which being known leaves us acquainted with the other. In the case of the Madras transit instrument, which is furnished with a micrometer, giving motion to a wire parallel to the vertical wires, I have always preferred measuring the error of collimation, and computing the corrections rather than attempting by mechanical adjustment to get rid of it, as is usual with small instruments ; and, on the same principle have always allowed the axis to take up its own position with regard to level ; hence we have only to apply to half the micrometer-reading of the reflecting collimator, the error of level with the proper sign, and the sum or difference, as the case may be, gives the error of collimation, thus :

		Reflecting Collimation,	Spirit Level,	Error of Collimation	Ditto	Difference.
		or L+C	or L	by Refn. Coll.	by Inversion.	
1835.		"	"	"	"	"
Feb.	7	4·34	2·60	1·74	1·55	0·19
	9	4·22	2·97	1·25	1·20	0·05
	11	2·92	2·74	0·18	1·00	1·18
	11	9·80	2·74	*7·06	5·58	1·48
	12	9·28	2·41	6·87	6·73	0·14
	13	9·18	2·61	6·58	6·62	0·04
	16	9·83	2·42	7·41	6·29	1·12
	17	9·97	1·63	7·34	7·17	0·17
	18	9·89	2·04	7·85	7·20	0·65
	20	9·37	2·70	6·67	7·19	0·52

* I increased the collimation error.

The above readings of the reflecting collimator are the result of three measures occupying at most about as many minutes to make; and the collimation error by inversion is from one inversion only. As regards the wants of the amateur astronomer in India, the reflecting collimator will I apprehend be eminently serviceable, if (as is very often the case) the level attached for levelling the axis is dull in its movements, or should it unfortunately be broken; and should moreover the observer's situation preclude the erection of a mark to examine the collimation error—nothing more is necessary than a basin of quicksilver and an eye-piece fitted up as above.

We will suppose that on looking into the eye-piece the centre wire and its image are *both seen*, and that the reflected image appears 10 diameters of the wire by estimation to the *east* of the direct image; this may arise from error of level or error of collimation, or from both; to decide this question, we must invert the axis and again estimate the distance between the direct and reflected images of the centre wire—suppose the reflected image to be now situated 6 diameters of the wire to the *west* of the direct image: we have,

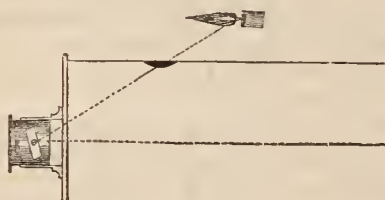
$$\begin{array}{l} 2 (L+C) = + 10 \\ 2 (L-C) = - 6 \end{array} \text{ reckoning } + \text{ for eastern and } - \text{ for western devi-}$$

ation: from the sum we find $L = + 1$.

———difference, $C = + 4$.

Shewing that the east end of the axis is too high by a space corresponding to the thickness of the wire, and that the centre wire must be moved towards the east four times its thickness. Other instances might be adduced of the efficiency of the reflecting collimator, but the above will I apprehend be considered sufficient.

A mere glance at the accompanying figure will explain all that is necessary to the construction, which I need hardly remark can be performed by any common workman.



Reflector, full size.



Madras Observatory, }
5th April, 1835. }

[The elegance, the simplicity, and the great practical accuracy of the method described above by the Madras astronomer, will we have no doubt recommend it to very general adoption.—ED.]

IV.—*On the Strata of the Jumna Alluvium, as exemplified in the Rocks and Shoals lately removed from the bed of the river ; and of the sites of the Fossil Bones discovered therein. By Serjeant EDMUND DEAN.*

[The Specimens alluded to are deposited in the Society's museum.]

It has always been a matter of speculation with me, since my first acquaintance with the Jumna, that presenting the obstacles to navigation, which it, undoubtedly, does at the present day, after seven years' application of great talent, and a very considerable expenditure, what a gigantic work it must have appeared at its commencement. Experience, however, and a careful research have confirmed me in the opinion, that many of these impediments in one shape or another, were then, and are now, not only such as, their existence once known, could easily be removed, but there is every probability of some of the most dangerous of them being at this instant in a state of active formation and increase.

Taking a general view of the whole, as they occur between Agra and Allahabad, I have found it convenient to class the obstacles most to be dreaded by navigators, as follows :

1st, Clay-banks or shoals ; 2nd, Rocks ; 3rd, Kankar shoals, and 4th, Sunken trees. This classification is adopted with reference to the supposed degree of danger to the navigation that may be attached to each, a detailed description of which I have endeavoured to arrange in this order.

The grand and perfect section of *the Delta of the Jumna and Ganges*, (or I should rather say, from experience lately gained to the westward, of the immense general alluvium of Hindustan, opened by the channel of the former,) presents a regular alternating stratification of the different modifications of which the general Dúáb alluvium is formed ; which consists (as far as the section has allowed me to examine), of five distinct strata, interspersed with imbedded substances which from their irregular growth, positions, and occurrence, cannot be classed among the more regular strata. The regular strata occur as follows, namely, 1st, Superior sandstone ; 2nd, Shale, and 3rd, 4th, and 5th, Alluvial, (fig. 1. Pl. XIII.)

Only two strata of the superior sandstone occur within the above bounds that I am aware of. The elevated positions of both decidedly have been produced by volcanic irruption, and will be described under the head of rocks.

The Shale which approaches nearest to *d*, var. of *A*. in the first division of McCulloch's synopsis, described as passing into clay, appears very seldom. *Note.* The specimens marked “ *y*, 1, 2, and 3,” all stand the

test of adhering on being applied to the tongue or lips. (Specs. *y*.)

1st. *Alluvial Clay*, corresponding with *a*, var. of *C*., first division; is much intersected with seams of kankar $\frac{3}{8}$ of an inch in average diameter, colour dull yellow, grey, and dirty white, and is interstratified with beds of nodule kankar varying between 20 yards, and half a mile in length (as exposed by the river), and from one foot to 15 in thickness.

2nd. *Alluvial Compact Sand* would form a var. *e*, of *C*., first division; does not agree with *c*, of the same division, as there is no portion of clay, and it is only partially consolidated by the pressure of superincumbent strata. It occurs both above and below the 1st alluvial stratum from 3 to 18 inches thick, and of indefinite length and breadth; in some places a few yards, in others several miles.

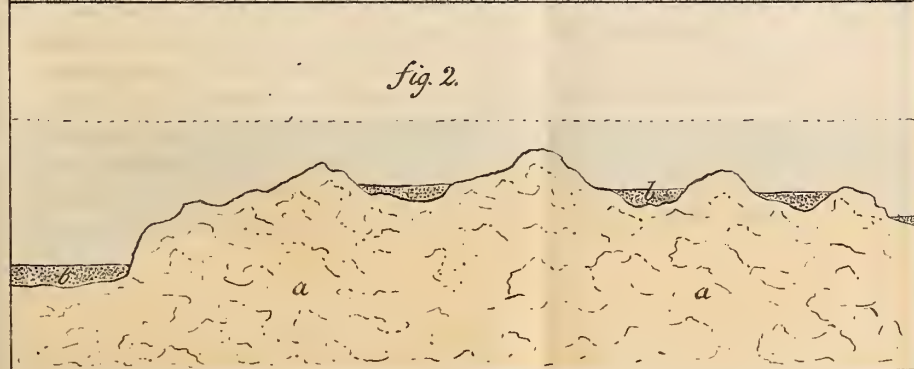
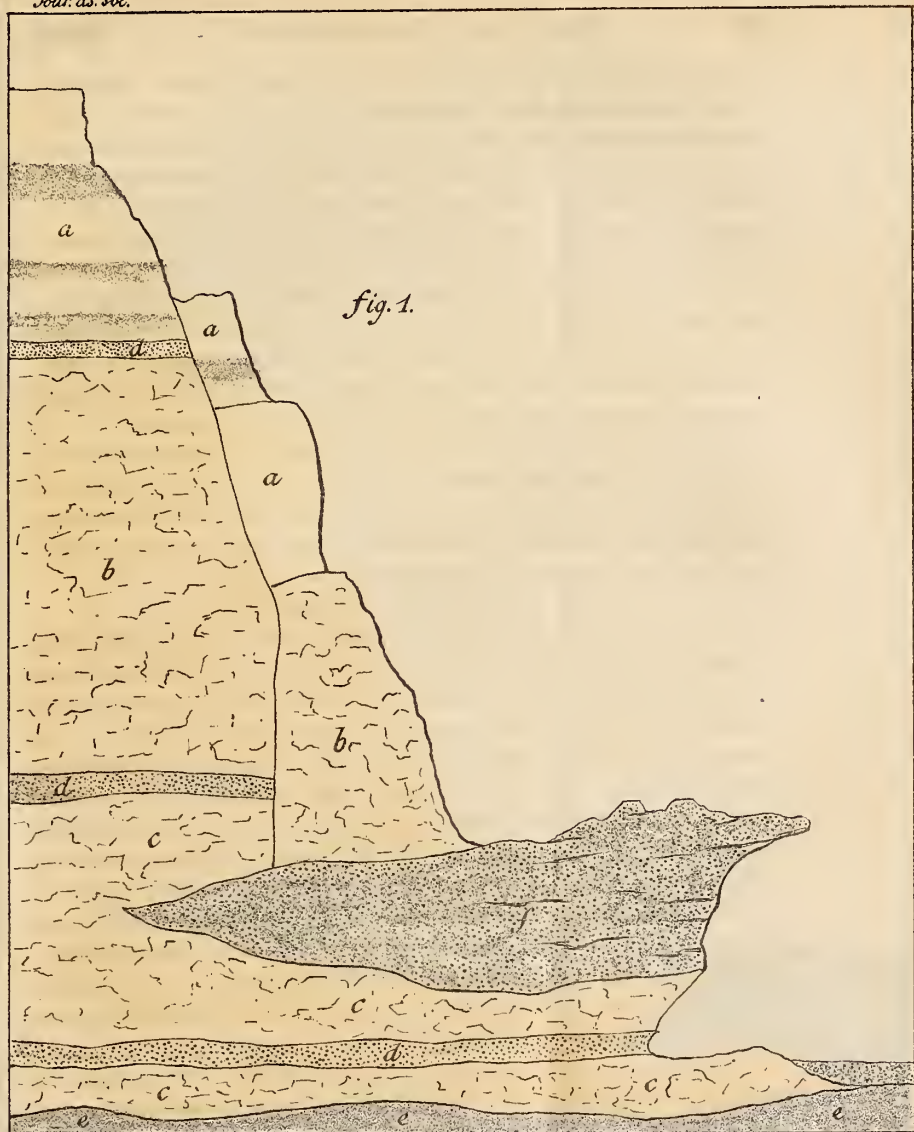
3rd. *Alluvial Clay*, with a large proportion of sand *b*, var. of *C*., first division of Mr. McCULLOCH's synopsis. This stratum is frequently varied in colour, giving it an appearance of divisibility; but on examination, this difference will be found to extend to colour only, which varies in many places between dull yellow and grey.

1st. Of Clay Banks or Shoals.

These banks (fig. 2. Pl. XIII.) so justly dreaded by navigators of the Jumna, are quite as unwelcome to those engaged on the Jumna works, as their removal is both troublesome and expensive. They are formed of isolated and detached portions of the 1st alluvial stratum, by an accumulation of sand forcing the stream into a new channel, formed by the whole of the 2nd and 3rd alluvials, and least tenacious parts of the 1st alluvium, having been swept away at high levels, leaving such portions of the last as were sufficiently compact to withstand the force of the stream, which are generally those where the natural toughness of the clay is increased by the seam kankar before mentioned, (spec. *x*.) which runs in every direction through it, literally lacing it together, and giving the clay a durability which the action of the strongest current has, perhaps, less effect upon, than it would have on a similar mass of stone of average texture.

The stream, which is generally confined in its course by these obstacles, rushes past them with violence, polishing (as much as clay is capable of such an operation) all those parts exposed to its action.

It was in the crevices formed by the washing away of the softer parts of a bank of this description, (figs. 1 & 2, Pl. XIV.) that the specimen of fossil bones, which were, I believe, presented by Capt. SMITH, and the tulwar, by Lieut. BURT, were found, whilst the clay bank was being removed, the whole upper surface of which was covered with from two to four feet of kankar, of the conglomerate formation. I should wish this to be remembered, as I consider finding the latter in such a





situation as peculiarly corroborative of my remarks relating both to these banks and to the kankar formation. No instance, however, has ever been known of petrified or fossil animal, or vegetable remains, having been found fairly imbedded in or under this stratum.

Another formation of these banks is occasioned by the current sapping the high and abrupt banks of the river, by washing out the strata of compact sand, when such large masses of stiff clay are detached and thrown into the channel, as to defy the efforts of the stream to dislodge them, which if not speedily effected, a sufficient time has only to elapse to clear the outer parts of the earthy matter which may have fallen with them, which together with sand immediately deposits itself in rear, when every hour secures and strengthens them in their position against the stream, (fig. 3. Pl. XIV.) The interstices (should there be any) are soon filled up with any extraneous substances that may be lodged by the current. Those organic remains which may happen to be imbedded, or rather buried under this sudden deposit, if petrified in that situation, may be easily distinguished, as they invariably adopt in the process of petrification, the hue of the mass with which they are in contact, and which, when the process is complete, nothing will remove, and the porous parts of the bones either remain empty, or are filled with carbonate of lime, infiltrated, whilst in solution. The same remark applies to wood or any other substance. In every other situation the interstices of the fossil to which the water has unrestrained access, is filled with either silicious or argillaceous matter, and frequently with a composition formed of both. For the proper consolidation of either of which, however, the presence of the carbonate of lime is necessary.

Both these formations may be, and frequently are, instanced in one specimen, where from fracture or decomposition, sand or clay may be admitted to one part, when the composition is formed, whilst it is excluded from those more perfect, the pores of which will be either filled with crystallized carbonate, or remain empty as above stated.

By the continual cutting away, and falling in of the banks of the river, the accumulation of alluvial matter in some places is necessarily very extensive. The strength of the current preventing its deposit in the channel, it is carried down to the bend of the river, next below whence it has been dislodged, in the shape of thick sediment, and deposited there; the sand which accompanied its removal is from its greater specific gravity deposited in the bed of the channel. This alluvium forms in banks from 6 to 14 feet thick, and composes, on a rough calculation, not less than 80 or 100,000 acres of arable land, of the first quality, between Agra and Allahabad; producing by

far the best crops of any land in the neighbourhood of the Jumna. Many of these deposits (which occur at every turn of the river) are several feet above its present highest levels; these, however, the river by having deepened in its course since their formation, rather diminishes than increases by washing out those veins of sand, (parallels to the 2nd regular alluvial stratum of the *Dúáb* general alluvium,) from one to six inches thick, which are invariably interstratified with this deposit: the more compact alluvial stratum above these veins being deprived of their support, separate and fall into the water in flakes, when, if the current is not too violent, the base of another deposit is formed, corresponding to the levels attainable by the river in its present bed, causing the upper surface of the united deposits, either to slope gradually towards the deep part of the channel, or the junction to be marked by a step or steep slope. All those, however, which are covered with only a few inches of water at the highest levels receive an additional deposit of sediment, which, however trifling, answers the purposes of the best manure.

2nd. *Of the Rocks.*

This term (as understood on the Jumna) is applied to four distinct formations, namely—1st, superior sandstone; 2nd, volcanic; 3rd, isolated masses, the remains of beds of nodule kankar, and 4th, conglomerate rocks, composed of kankar and extraneous substances.

1st. *Of the superior Sandstone.* The only strata of this formation occur at intervals between the neighbourhoods of *Bárríari* and *Dhowrie*, two villages on the right bank of the river, and near *Mhow*, a village in the *Bundelkhand*.

Near *Barriári* a great deal of good stone for building purposes, and of any dimensions, is quarried, (fig. 1. Pl. 3. spec. 1.) and sent to *Allahabad*. Very good stones are also procured from many parts of the bank near the above places, by removing two or three feet of loose earth or clay. It is fine grained, and very similar in colour and quality, to that procured from the neighbourhood of *Bhurtpore*. In fact I believe them to be portions of the same stratum, but am not sufficiently acquainted with the geological features of *Bundelkhand* (the intervening tract) to make the assertion.

A portion of this stratum, thrown together in large masses by volcanic irruption, forms the curious little rocky island on which a *Shiwalá* is so picturesquely perched in the centre of the river opposite the village of *Dhowrie*, about two days' journey from *Allahabad*.

The other stratum occurs at *Mhow* only, and extends more than one-third cross the river, and is so friable and coarse as to be totally unfit for any useful purpose. Occupying its present situation, it

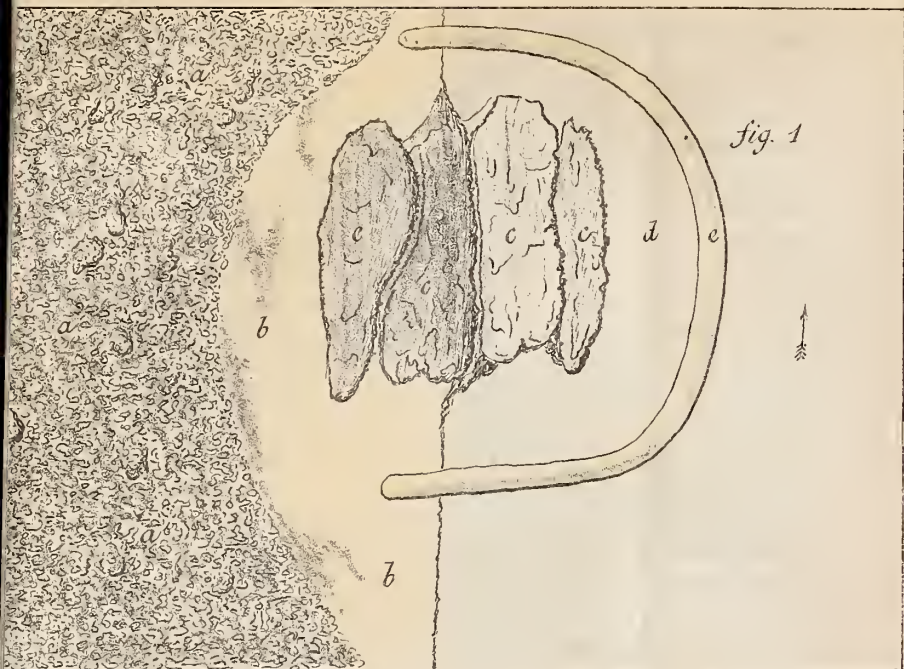


fig. 2.

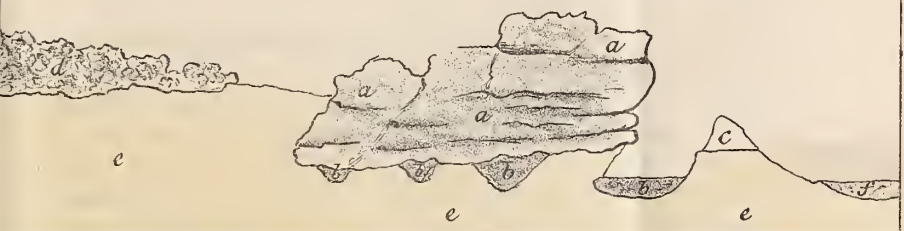
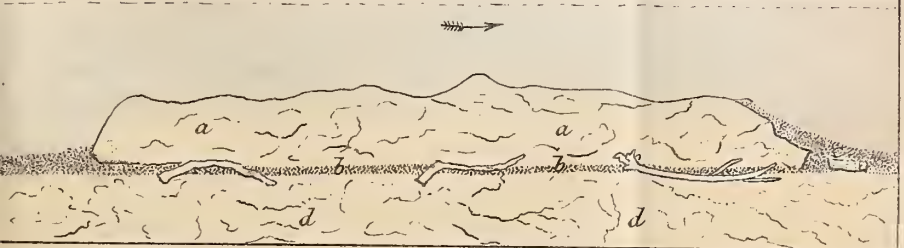


fig. 3.





has caused infinite trouble, not only by the interruption a body of any sort must be to the navigation in such a place, but by the irregularities of its surface (forming the bed of the river), acting as receptacles for the moving kankar and other extraneous substances passing over it, in which have formed irregular masses of conglomerate rock occupying two-thirds of the whole width of the river. These, perhaps, at the time of their formation did not stand more than a few inches above the bed of the river, (the upper surface of the sandstone rock,) but the river deepening its bed in the course of ages has gradually worn away the sandstone, leaving the masses of conglomerate (on which it can make no impression), in the awkward and dangerous positions which they now occupy, with deep water all round them; and although some of the most dangerous have been removed, the passage down with a side wind is often impracticable to the clumsy boats used on the Jumna. It has this advantage over Karim Khán, (the worst pass in the river,) that the stream is not near so rapid.

Those portions of this stratum which lie near the edge are exposed to the effects of the stream in a minor degree, and stand from one to five feet above the lowest levels, presenting peaks and heads of masses at irregular intervals over a space of about 500 by 200 yards. The exteriors of these are of a dirty green colour, which penetrates about one-eighth of an inch, and is, I imagine, caused by the action of the atmosphere. Under this coating, the natural colour of the stone appears, varying between every tinge of yellow and red, and pure white, which would indicate the presence of some portion of iron; but one sight of the accompanying specimens will convince you, Sir, that but for the presence of some consolidating medium, the sand of itself would never resist the action of any stream. This consolidation occurs in the shape of numerous veins, from one-fourth to two inches in thickness, and from three inches to many feet in width, passing through it in every direction, and rendering it quite impervious to the stream with which it has to contend; and from the feeble attempts of which it is in fact defended by some masses of volcanic origin, which are described below. These veins (spec. 2) are either the deposit of some ferruginous spring, which has had a passage over the stratum, and on which the sand has from time to time accumulated, or is a lignitious lava; they occur in every position, horizontal, vertical, and at every possible angle with each of these: their outer edges are black, and bear a very high polish, produced by the action of the water. The fracture presents an appearance which would justify the conjecture of this substance having passed into the present position in a state of fusion, as it encloses a substance within itself, having a vitrified appearance.

The total absence too of iron within the bounds I am endeavouring to treat of, in any of the alluvial formations, and the intimate connexion existing between the sandstone, and substances of undoubted volcanic origin, strongly incline me to the opinion, that the heat necessary for the production of the latter, might have split the former, and that the interstices thus produced, have filled with the lava, (the present veins,) in a state of fusion. Another circumstance, confirmatory of this, is the fact of the sandstone being in a state of transition with the vitrified substances; but owing to the brittleness of the intermediate substance, (spec. *d.*) it was with the greatest difficulty I could procure the accompanying specimens.

Of the Volcanic Rocks.

These occur in two separate situations, namely, at Murka and Mhow. You will perceive, Sir, that the specimens from the former place, agree with Nos. 4, from the latter, although the shortest distance between these places cannot be less than 20 miles, perhaps more.

The mass at Murka, consisting of rough spheroidal blocks, varying from one by two, to three by five feet, lies on the right bank of the river; their peculiar shape, appearance, and position, leads me to imagine, that they have been ejected in a partially vitrified state, and lodging in the water, the outer and angular parts have become slackened, and have been swept away by the stream, leaving these blocks, which, under these circumstances, are exactly similar to the core of badly burnt lime; in no other way can I account for their peculiar formation, which had it been produced by rolling, the same cause would have scattered them widely, but this has not been the case, as they lie in a clearly defined mass, (fig. 2. Pl. XV.) and in this instance, have no other connexion with any other stratum than being superincumbent.

They correspond exactly with Nos. 4, from Mhow, both in the degree of vitrification, colour, texture, and every thing but position; those at Mhow overlie, but are entirely detached from their bed, (sandstone,) and the same quantity is scattered over a greater space than at Murka. Their exterior is jet black, and so highly polished, that it is impossible to examine them for any length of time when the sun shines, the great light and heat they reflect during the day is peculiarly distressing to the vision. The interior is a mottled dark, and light red, one view of which is conclusive of its volcanic origin. (Specs. 3 and 4.)

Nos. 5, are specimens also from Mhow, the originals, (spec. 5,) occur in very considerable masses, having both sandstone and clay as a base, and standing above it from 1 to 20 feet; the largest of these

masses is about 45 feet in diameter, of irregular shape and lighter color, than the detached masses, and evidently has not been nearly so much subjected to the action of fire as the latter; they are much softer, and have interstices filled with earthy matter, which has been subjected to great heat, but are only partially vitrified.

This substance either passes into unburnt clay of the 1st alluvial stratum, or the stratum of superior sandstone, on both of which it rests, (Specs. *c* and *d*.)

The singular appearance and conformation of the detached masses could not fail to attach something of the marvellous to them. Native tradition states them to be the stones which the army besieging Lunká, under Ráma and Lutchmun, were enjoined to bring for the purpose of building the celebrated bridge; but enough having been accumulated, messengers were despatched with the news, two of whom posted themselves at Murka and Mhow, two ghauts on the Jumna, and each, *Lungoor* and *Tulah*, arriving with his load, hearing the welcome tidings, it was deposited here, and he proceeded lightly on his journey. I had this version from a Brahmin, who begged me, whilst getting my specimens, to remember that such relics should on no account be disturbed.

Of Isolated Masses, the Remains of Beds of Nodule Kankar.

Whenever these remains occur, the river is by their considerable extent generally contracted in its course, causing the water to rush through the narrow but deep passages between isolated masses of what was once one continuous bed.

The passage at Karim Khán (fig. 1, Pl. XVI.) (the point d'appui of the Jamna works,) is now and has been perhaps for centuries, solely affected by the presence of the remains of an extensive bed of nodule kankar, and is at the present moment the worst pass in the river for boats passing downwards at all seasons and upwards in the monsoons. As a description of this is applicable in its general outlines to every locality where these remains occur, I shall confine myself to it.

This bed has originally been and is still partially connected with and resting on the right bank of the river; its surface I imagine to be about 75 or 80 feet below the average level of the Bundelkhand bank, and the bed of the river to be about 16 feet below the surface. The left or Dúab bank is not above two-thirds the height of the opposite one, and is protected by a very extensive shingle shoal; had it been a bank on which the stream would have made any impression, the river would have certainly taken a course more free from impediments than the one it now pursues. The stream being thus confined, has, by the gradual deepening of the river throughout its course, been at last

thrown over this bed of kankar with sufficient force to break it up partially, and the remains present a number of detached masses protruding across two-thirds of the river, from the right bank, standing from four to five feet above the surface of the water at low levels, exposing the whole thickness of the bed, which varies between three and five feet, and an average of two feet of its substratum a stiff clay, and between them deep channels are worn. The action of so rapid a stream on all sides of these bases of clay (the supports of the superincumbent kankar) is gradually but surely reducing them, and in the course of time, becoming too feeble to support its weight. The kankar will be deposited in the bed of the river some 12 or 14 feet lower than its present position.

These masses, which vary from a few feet to many yards in size, are externally very compact and hard; but on penetrating 18 inches, it will be found, that they maintain inside this crust a similar appearance and quality with any bed that might be opened in the centre of the Dúáb, namely, the interstices between the nodules being filled with a loamy clay, and having every appearance of having been undisturbed since the formation of the bed.

It was on the strength of the unsuccessful search I have instituted in and under such strata as this, that I hazarded the opinion that I should consider the slightest discovery of fossil (animal) remains at a level corresponding with the deepest parts of the river, as the merest possible accident: perhaps I should have rather said, fossil remains may possibly be found in the Dúáb general alluvium; but it must be under parallel circumstances with those producing the Jumna fossils, as it is impossible to suppose that during the accumulation of this immense formation that such a space was void of animal life.

The question mooted by GRIFFITHS in speaking of the fossil remains of elephants, "Can we suppose that none are buried there (in climates to which the elephant is native), or that the bones have been decomposed by the force of heat;" chimes so much in tune with the idea that possessed me on examining every excavation in the Dúáb to which I could get access, previous to being acquainted with the section formed by the Jumna, that even now I should feel little difficulty in asserting, that unless some sufficient body intervenes between organic remains and the decomposing power of the sun's rays, soon after their assuming a morbid state, no vestige of them ultimately remains. Experience has proved that they are buried, fossilized, and petrified within the limits of this general alluvium; but in my opinion they are not even cotermporary with this formation, but of a date more recent: for with such an ample section before us, as is presented by the Jumna,



would it be possible, where from the presence of strata of the secondary series, the complete section of the alluvium must be exposed, that within the limits I have examined, not one instance of fossil remains has occurred imbedded in it? To what cause then can their absence be attributed, but that they have been decomposed by the force of heat, before they could attain a state necessary for their preservation? To what then do the present specimens owe their existence? I must suppose either to the interposition of some body (water for instance) between them and the sun's rays, or to their having been petrified in the colder latitudes of the Himálaya, and lodged in the situations from which they were procured by the action of the current.

The fact of their being found in every stage between freshness, fossilization and petrification entirely excludes the idea of their having been uncovered by the deepening of the river having washed among any portion of the secondary strata, by which they would have been exhumed from the stratum in which they had been petrified: had the petrification taken place there, they must have all occupied that position from the known age of the general alluvium; a sufficient time to have been all alike or nearly so, which is not the case.

The following observations made on the conglomerate formation may throw some light on the subject.

The Conglomerate Rocks,

Are composed of nodule kankar and extraneous substances—and consist of two separate formations, both of which are strictly mechanical, together composing one-third of the rocks of the Jumna. Their difference consists in one formation being consolidated by means of cement, the other by the intervention of carbonate of lime deposited whilst in solution in all the interstices of any mass, thus connecting the whole together.

Before proceeding further, it will be necessary to explain how these nodules of kankar and extraneous substances are accumulated, and then show the method of application of the consolidating bodies. In all the high and nearly perpendicular banks of the Jumna, ravines are cut out by heavy runs of water at short and irregular intervals, which serve as drains to the surrounding country. During the heavy periodical rains, considerable bodies of water rush through these ravines with great violence, bringing down drift wood, rubbish of every description, nodule kankar, and large portions of clay detached by the water from the sides and beds of the ravines. The latter generally arrives in the river rolled into figures varying between a prolate ellipsoid and spheroid, (spec. z.) of all sizes, and from 20 lbs. to $\frac{1}{4}$ of an ounce in weight. The clay being softened in its rolling progress,

attaches to its circumference every substance hard enough to make a sufficiently deep impression to secure its hold ; this continues until every portion of the outer surface is covered, when, of course, the accumulation ceases ; in this state it is washed from the ravine into the bed of the river, on reaching which, it is carried forward in a new direction of the current of the river, which deposits it in the nearest hollow in its bed, where after lying a sufficient time, the body disunites ; the lighter earthy particles are swept away by the stream, whilst the clay kankar, and other substances which may have been brought down with them, remain as deposited there : thus are all the necessary ingredients at once provided for the formation of a conglomerate rock except the sand, which in the course of a few hours generally proves the most abundant article of the composition, when only a sufficient time for the cement to set is necessary to present a rock, which the carbonate of lime (which fills all interstices that may be left) ultimately renders the hardest, and from their situation, very frequently the most dangerous rocks of the Jumna. (Specs. 6.)

The conglomerate in which carbonate of lime is the consolidating medium is generally produced by the breaking up of the beds of nodule kankar, by the supporting pillar of clay (its substratum) being washed away, or other causes, the loose or interior nodules, of which are then deposited in the nearest hollow lower down the stream that can detain them, when from the absence of clay (excepting this dislodgement occurs in the monsoon), the cement cannot be produced, and the deposit remains until by the usual process of tufa formation, the whole becomes one consolidated mass, (spec. 8,) this, however, must be the work of time, during which, sand often fills many of the interstices, and becomes a part of the conglomerate body.

The fractured edges of remains of nodule kankar beds often present this formation, although from the difficulties it has to encounter, a very small proportion of the conglomerate rocks of the Jumna belong to this class. The principal tufa formation that I am acquainted with, was removed by Lieut. MARTIN, Engineers, from near the village of Orowal, where the accompanying specimens were collected. (Spec. 8.)

Most of the specimens in your hands, Sir, will speak for themselves. I select, however, one instance of the cement formation, in which the fossil remains of an elephant are imbedded, which I consider, claims a particular description.

The site of the mass containing these interesting remains on the right bank of the river, about 12 miles from Korah Jehánábád on the high road to Cawnpur, directly under the village of Pachkowrie, which stands nearly 80 feet above it, lying amongst an immense as-

semblage of kankar deposits of various ages and appearance where it is conspicuous by its size and thickness*. The bank on which these have been formed, is a portion of the first alluvium stratum.

The existence of these remains, in the position they occupy, bears me out in the assertion that one-third of the rocks of the Jumna are of a mechanical formation, and some may even possibly date their formation within the memory of the present generation, that are now some feet in thickness, and of very considerable extent; others only in embryo which may, on arriving at their full size, be able to turn the course of the river. As I imagine three feet to be the maximum, and half an inch the minimum, thickness in ordinary cases of any layer deposited in one monsoon; for at this season only does it receive any considerable addition: the product of a heavy shower or short continuance of unseasonable rain, I imagine to be very trifling; the ground being generally in so parched a state near the banks of the river (where the drainage is so rapid and complete), that an ordinary shower is absorbed, or nearly so before reaching it, producing no other effect than a run in the deepest parts of each ravine, which ceases almost as soon as the shower.

Others, however, of the same formation are entitled to be considered of proportionally great antiquity; for if my position be established, that it is to some peculiar quality of the water, combined with the other consolidating bodies, we owe not only the majority of the rocks of the Jumna, but the organic remains that have been or may be discovered, there must be some instances of both existing, whose ages must be coeval or nearly so with the river itself, as the same causes must always produce the same effects, and once produced, their positions and appearance may be altered; but the greater their age, the more combined and natural do these substances become, until their appearances present so little in consonance with conglomerates of the most ancient structure, that nothing, but an examination equally minute with that I have bestowed on the subject, can distinguish between them. Those having pretensions to antiquity are the ones occupying levels to which the river seldom now ascends, and never continues at such heights more than a few hours together, with others quite out of the reach of the present highest levels.

In the specimen before us, the form of each bone in its position in the deposit has been accurately preserved, but not in a state in the slightest degree approaching what it would have been, had they been exposed to the uninterrupted action of the water, which proves that

* The plate referred to here in the MS. is omitted.—ED.

the animal has either died in, or has been after death washed, to, the position it now occupies, on which the deposition of kankar and other substances has still continued, thus rapidly enveloping it in a crust, which accounts for the absence of petrification, (specs. *a* and *b*;) for I have observed that in very few instances, where organic remains have been imbedded in the kankar deposit, has the bone materially differed from the present specimen. Instances have occurred, and still may be referred to, as existing at the present moment, whereon the deposit having attained the highest level of the river, or from the sinking of the river in its bed, it has been left at a level scarcely ever attained now at its highest rise; where the formation has necessarily ceased in these cases, those bones which with other extraneous substances help to form the upper crust or surface of the deposit, are generally from their being larger than the nodules of the kankar, but partially imbedded; that part which has been exposed to the action of the water, is perfectly petrified, and is rather darker than the surrounding kankar: whereas the part below the surface maintains the same colour, appearance, and quality, (fossilized, but not petrified,) as this specimen or nearly so, allowing for the difference in the size of each, (spec. 7,) and the proximity of the petrifying medium to the former, which, I consider ample proof of the rapidity of the formation; as, if the process was slow, many instances must occur of bones or wood in a thoroughly petrified state, being met with imbedded in these masses. I have found, however, nothing approaching nearer a state of petrification than specimen Nos. 7, which are completely fossilized, but not petrified.

Another proof of the rapidity of the formation is, that the interior is not much more consolidated than the interior of a bed of loose nodule kankar, and the only difference between them is, that the interstices between nodules in the latter are generally filled with loamy clay, whilst here sand occupies its place.

The antiquity of this particular specimen must be very considerable, as I question if the upper parts are covered during the highest levels. The river has deepened its bed abreast of it about 25 feet, which even supposing it to have never occupied a higher level than at present, which cannot of course be now ascertained, precludes the possibility of any addition having been made to it for ages.

Numerous instances of organic remains occur in other masses of different deposits lying in all directions round it, but the grand scale both of these remains and of the mass in which they are imbedded, completely throws them into the shade.

The sides of the mass presented to view in the accompanying sketch* are evident fractures caused by the breaking up of the field by the deepening of the river in its course, and although the present mass is of the largest dimensions met with of this formation, I have no doubt it forms but a mere particle of the field as it originally stood, the remains of which now occupy various isolated positions in the river abreast of it, which run across two-thirds of the whole breadth.

Many other observations might be made on this deposit (and this specimen of it in particular), that do not now occur to me; but they will readily suggest themselves to some more intelligent visitor, who may be induced, from these remarks, on passing the spot, to give it an hour's examination.

As I believe no instance is on record of any other organic remains than shells having been found in those strata of kankar opened in so many parts of the Dúab, in excavating wells, and for the purpose of being burnt into lime, &c., the conclusion I draw from the observations I have been enabled to make, are all in favour of the opinion given in my letter of the 2nd of August, that I do not consider the fossil remains of the Jumna, as at all connected with the natural kankar formation, for wherever the specimens hitherto collected have been found, circumstances quite as conclusive as those above pointed out attend to shew that only these mechanically formed masses are in the slightest degree connected with the fossils, and that the formation is decidedly confined within the action and limits of the river, either past or present; but very possibly similar ones may be met with in parallel situations in other parts of the Dúab, generally alluvium, as yet unrecorded.

In your note on the Narsingpur fossils, I consider A A, the rocks in which the bones are imbedded, to be a most accurate description of the deposit rocks in the Jumna, if kankar was substituted for rounded pebbles: of course, this difference the localities of these specimens has alone effected, as the distance from the hills (which alone could supply rounded pebbles of the Nerbadda, at Narsingpur) is so much less than the Jumna at Pachkowri†.

* A rough pencil sketch is here given in the MS. of the mass of kankar "of the deposit formation," containing the fossil elephant near Pachkowri; it lies $4\frac{1}{2}$ feet above water-mark: the description in the text has been deemed sufficient without the plate.—ED.

† This conglomerate varies its character according to the rocks which have supplied the rounded pebbles of which it is composed; these are sometimes granite, sometimes kankar, and sometimes jasper or vitrified clay.—A description of extensive deposits of it in the Rájmahal hills will be found in the extract from

The position too of the rocks shewn in section, (fig. 1, Pl. 21, of Vol. II.) as containing fossils, is such, as I should have given them, had an elevation of the bank of the Jumna been required of me. Of course, I have had no opportunity of comparing the specimens from the above places; but from their general coincidence in position, and the fossil remains found in each, I am led to believe an intimate connexion exists between them in date, formation, and structure, and if, Sir, you think I have satisfactorily shewn the system of the deposit kankar formation in the Jumna, I think the same description would apply to similar formations in the Nerbadda.

3rdly. Of the Kankar Shoals.

These are composed of every variety of substance that is ever in motion in the Jumna, the most common of which are broken bricks, bones, shreds of earthen vessels, wood, fragments of granite, sandstone, quartz, agate, water pebbles, petrified clay, and composition shingle, of every variety of mixture that the clay of the surrounding country and sand of the Jumna will admit of. This last bears a proportion of four-fifths to the whole, which being mistaken for kankar, (of which the quantity is very trifling,) has occasioned the misnomer of kankar shoals.

It is among this heterogeneous assemblage of substances, that the best specimens of petrification are to be found. Bones, however, in every stage between freshness and a state approaching the hardest stone are procurable by turning over the surface about a foot deep; but I imagine, in fact I have ascertained, that not only more perfect, but a considerable abundance of the best specimens would be found at greater depths; as, during levels of the river sufficiently high to cover these shoals, the fragments near the surface are subject to violent attrition, and bones and other fragile substances, to total demolition, from the masses which are at such times continually rolling over them. Numerous instances occur in some of these shoals to support

BUCHANAN'S MSS. published in the *GLEANINGS*, vol. iii., where also its characteristic of containing "giants' bones" is preserved in the very name of the place, *Asurhár*:—this circumstance has been brought to our notice lately by Mr. STEPHENSON, who has lately learnt that a gentleman at the Burdwan colliery has collected a number of fossil bones, and shells from the sides of other hills of the same range. Being very anxious that this field should be again and more thoroughly explored, we have republished the passage from Dr. BUCHANAN on the cover of the present No., and would direct the particular attention of our correspondents at Monghyr, and of the engineers engaged on the Rájmalahal canal survey, to the whole line, which will probably prove as prolific as the Nerbadda or the Jumna. It may also afford proof against Mr. DEAN'S account of the formation of the conglomerate, and introduction of the bones within it by the action of the river.—ED.

the opinion before advanced, namely, that the force of heat is capable of causing the decomposition of bones, unless shielded by some intervening substance, applied during a state of freshness, and continued up to a certain period, the time of which must vary according to the quality of the bone; but my experience does not enable me to set bounds to the time necessary to render one of any quality proof to the effects of the sun's rays. I imagine, the seasons may cause so much variation, that the exact time necessary for them to continue under this protection, cannot be better defined than between the time of their deposition in a state of freshness, and the extinction of every animal or vegetable property, when they become nothing more than consolidated earth; (see specimens, the remainder of a pipal tree, Nos. A 3,) and even in this state I am led to believe, that exposure to the sun would cause decomposition, and to this, as well as to the effects of attrition, must be attributed the very few perfect bones found in these positions. I once found the femur of a camel, the middle of which was covered by a large damp stone, the portion covered was perfectly petrified in its whole circumference, whilst both ends were decomposed; but the absence of fossil remains in the whole section of this general alluvium is more conclusive than any minor proofs that can be adduced.

Very few specimens of wood occur in these situations. To the reasons advanced in explanation of the imperfect state of the bones is to be added the greater degree of brittleness of this substance in a petrified state. I have never procured more than three specimens from the kankar shoals, which I will forward with the other specimens of the collection.

Petrified clay (Specs. 9,) is found generally in small portions, and is transmuted by the same process as the earthy substance, to which wood is reduced previous to petrification, (spec. A 3,) which to all appearance has every property of indurated clay, the specific gravity of each being nearly the same.

Composition shingle, or cement pebbles, are produced by the admixture of clay or sand in almost every proportion of each: the most common process of the formation is as follows:

After a heavy shower, the water in its passage through the ravines near the river brings down with it clay in the shape of a thick sediment; this in many instances, after leaving the mouth of the ravine, has to run over large sand beds before it reaches the river, through which any considerable body of water cuts deep passages or gulleys, which run nearly horizontal 10 to 20 yards, and then fall 4 to 12 feet; running on again, they fall and run on irregularly, until reaching the

river. When the principal body is passed, the sediment becomes thicker, and dropping over these falls, mixes with the sand of the horizontal run beneath, forming first a single irregular mass on the upper side, whilst the under is pretty irregular, and of a rounded form : in this at first the sand predominates, the sediment continues dropping and adding to the stone, until all the sand within reach has been sucked in, when the formation ceases, and all the sediment that continues to fall on the same spot, adds nothing to, but merely rests on the composition, and is washed off by the next run of water, leaving a perfect stone. Six or eight stones are very frequently formed in this manner, of different shapes and varieties of composition, under the same fall, which is entirely regulated by accident ; in some of these sand predominates, (specs. 10 and 11,) in others clay : again, the composition consists of nearly equal portions of each. One fall may produce 10 or 12 stones separate, which another run of water may from the sediment falling on a layer of sand deposited since their formation unite, thus forming one stone, (spec. 12,) the difference between the first formed and their cement being very perceptible. The cement becomes set and as hard as dry mortar in two hours after the mixture has taken place, and after three days' exposure to the sun, they attain the substance of stone more or less hard, according to the justness of the proportion of the composition ; these stones being generally round, are more frequently in motion than any other substance, and is owing to mistaking them for natural kankar, (I say natural, as I believe the substance to be kankar, of mechanical formation, the same ingredients forming in my opinion both,) that the term kankar shoals has been applied.

Of the Sunken Trees.

This dangerous obstacle to navigation is so well known from its occurrence in almost all navigable rivers, whose banks are covered with wood, that little need be said of it here.

The trees have originally occupied a position on the verge of the bank, which the stream having undermined, they have fallen into the river, with a quantity of earth attached to the roots, the weight of which firmly anchors them to the bottom, the head laying with the stream. In the Jamna any portion visible above the lowest levels is cut off to the water's edge by the inhabitants of the nearest village, leaving the bluff stumps of the large branches in the most dangerous position possible, at average levels. In 1833, the whole of these between Agra and Allahabad were sought for and taken out, and by the precautions then taken by the superintendant, it is next to impossible that any other instances can occur for many years, as every tree with-

in a certain distance of the river has been cut down, and others still farther back marked for the same purpose 10 or 12 years hence.

A few may perhaps be drifted out of the Chambul and other tributary streams, but of so little consequence from their small size (the large and dangerous ones lying where they fall), that this obstacle may be said to be almost entirely surmounted.

Description of a cluster of four palms and a pipal tree. These remains have belonged to trees once growing on the general level of the Bundelcund bank, which having been sapped by the stream, they have slipped down with the earth, in which they grew, in the manner represented in sketch No. 7, (7. fig. 1. Pl.)* The pipal having been nearest the river has fallen lowest, and according to their distance from the edge do they now occupy their present positions, forming as it were a graduated scale, proving more strongly than any other instance I am aware, the petrifying qualities of the water. All I could write on this subject would not be so conclusive of this assertion as one glance at the specimens, which I shall merely describe.

A is the bark of the pipal stump, five feet in diameter, and about 14 feet long, lying on a sloping bank, with the root towards the river.

A 3 are portions of the body or trunk, which is reduced to that state, which I conceive necessary for any substance to attain before petrification commences, viz. a total extinction of all its animal or vegetable properties: whether the wood is actually changed into stone, or the gradual formation of stone merely destroys and takes its place, I am not able to decide; I can only say, when once properly petrified, the rings, the marks of annual growth of the tree, remain as apparent as when in a vegetable state.

A 2 roots of do. in a similar state to A 1.

B remains of the palm No. 1

C do. of do. No. 2

D do. of do. No. 3

E do. of do. No. 4

} of sketch No. 7.

The very apparent difference of texture between specimens Nos. 1 and 4, is caused by the former lying lower; it has been more frequently exposed to the action of the water than the latter. Nos. 2 and 3, occupy intermediate levels.

In adopting the term "petrified," as regards the palms, it is necessary to observe, that the striated fracture precludes the idea that this is the wood, the grain of which would be longitudinal, and confirms it as a tufa formation, enveloping the several parts of the tree exposed. Still I imagine, there are sufficient portions of fibres really petrified, to warrant its being applied as a general term to these specimens.

* We have conceived it unnecessary to insert this sketch.—ED.

P. S. I have found on comparison that I had come to wrong conclusions, with respect to some of the vertebræ, I had the honor to send with the last parcel, of which opportunity I availed myself to send all of which I had the least doubt. The teeth too, which I have hitherto called camel's, cannot have been rightly classed, as they bear not the least appearance of having belonged to the existing species, at least, the evenness of the crown differs entirely from any anatomical specimen to which I have access.

I should have forwarded the whole of the undermentioned specimens before, but obvious reasons induced me to wait the present opportunity.

List of specimens illustrating observations on the obstacles to navigation in the Jumna, forwarded from Delhi, 22nd October, 1834.

A, B, C, D, E. Specimens of the remains of a cluster of one pípal and four palms.

F. Parcel containing 10 specimens of petrified animal remains, viz. Nos. 2 and 3, teeth. Unknown.

„ 14 portions of Asiatic elephants' jaw and tooth.

„ 38 and 39, upper extremity of femur and kneepan.

(Of these I had myself no doubt, as having belonged to a camel; but some doubt having been expressed in another quarter, I have left it to your decision.)

Nos. 40, 41, 45, 48, 49. Vertebræ.

x. Specimens of pipe kankar.

y. Supposed shale.

z. Rolled clay connected with the formation of conglomerate rocks.

a and b. Fossil remains of an elephant from Pachcowrie. Femur and enamel of tooth.

c. Specimens of clay passing into or vitrified clay.

d. Specimens of sandstone passing into ditto.

1. Fine sandstone from Burriarie.

2. Coarse ditto, from Mhow.

3. Specimens of vitrified clay from Murka.

4. Ditto of ditto, from Mhow.

5. Ditto of ditto, from ditto.

6. Cement formation of conglomerate rock.

7. Tufa ditto, of ditto, containing blade bone of camel and other animal remains.

8. Specimens of outer edge of beds of nodule kankar, conglomerated by carbonate of lime.

9. Specimens of petrified clay.

10. Composition shingle, in which sand predominates.

11. Ditto ditto, in which clay ditto.

12. Ditto ditto, of separate formation, cemented into one mass.

13. Specimens of sandstone peculiar to the Jumna.

NOTE.—We intended to have given plates of the principal fossils forwarded by Serjeant DEAN, but the friend who had kindly undertaken to draw them has been prevented from accomplishing his task in time; we must therefore reluctantly postpone their insertion and notice.—ED.

V.—*Note on the Gold Washings of the Gúmti River. By Lieut.*CAUTLEY, *Beng. Art.*

In the 18th volume of the Asiatic Researches (Physical Class), the occurrence of gold in the line of mountains skirting the foot of the Hímaláyas has been brought to notice by Captain HERBERT, and as in his specification of the points where it has been found, he has drawn our attention chiefly to the Rámungga, and its tributaries east-ward of the Ganges, and has not noticed the tract of mountains upon which the town of Náhun stands: and as in the system adopted by the natives in washing the sand, as described in the paper alluded to, there is some difference from that of the Náhun washers; it will be perhaps interesting, not only to bring forward this new locality, but also to shew the simple means adopted in procuring the mineral.

The late grand discoveries of organic remains in the hills under Náhun, and the consequent desire of prosecuting the inquiry as far as means would allow, have like many other searches led to the discovery of an object of a totally different nature from that in pursuit; nor may we be far wrong in agreeing with Captain HERBERT, that the ultimate discovery of gold in abundance in these regions will eventually either benefit some fortunate individual, or else come at once under the eye of the ruling power of the district.

I will however enter upon the subject of this note, previous to discussing the probabilities of discovering the ore in situ.

The rivers from the beds of which the sand containing the ore is procured derive their sources solely from this lower tract of mountains, and are not in any way connected with the Hímaláyas! There does not appear to be any river free from the ore, although many of them are considered by the washers as more abundant than others, and consequently more worthy of their labor: that to which I shall particularly refer is named the Gúmti river, which leaves the mountains at the village of Chúran; Gúmti being the name of two villages on the right and left of the stream, about three miles in the interior, at which there is a main junction of tributaries; the river opens into the plains opposite to the town of Sidoura, to the westward, and parallel to the Choura Pani and Markunda river, which carry off the greatest portion of the drainage from the hills directly under the town of Náhun.

The gold-washers are by no means numerous, and are of the poorest class, depending entirely on their trade for support. The Rájá of Náhun levies a tax of a *masha* per annum on each trough: but although there is no restriction to the number of people employed, as long as this

toll is paid, there does not appear to be any desire or competition on the part of the natives to carry it on, by which we may draw a tolerably accurate conclusion on the returns of the trade as it now exists.

The apparatus used by the washers consists simply of a trough, a sieve made of the Sirkunda grass, a flat piece of board, with an iron edge for scraping up the sand, a plate or dish for carrying it away, and tritulating the sand with mercury, and a ladle or spoon made of a gourd, for raising water: with these and a little mercury in the end of a hollow bambu our gold-washer starts on his pilgrimage. I have endeavoured in the accompanying sketch Pl. XVII, to give some idea of the process, and this will perhaps be clear enough without much explanation. The gold washer, in the first instance, examines the soil by washing a small quantity in his hand, the smallest particle or particles of the metal are easily detected: the soil holding the greatest quantity appears to be that in the line upon which the drainage of the river takes place, for these mountain streams occupy but a small space of their channel during the dry months, or even at any time, with the exception of those periods, during the rainy months, when very heavy and successive falls of rain charge every channel with its full supply. The situation proving favorable, the washer then establishes his trough; the sand is placed on the sieve, and water thrown over it with the spoon: the coarser particles are thus separated and thrown away; the man still continues pouring water through the sieve over the sand in the trough, until nothing remains there but an almost impalpable blackish powder; in this powder the gold dust is perceptible. This powder is then collected and taken out of the trough, forming a mass capable of being held in both hands: this is tritulated with a small quantity of mercury on the dish or basin B, and the whole is again subjected to a careful washing with the hand on this dish: this latter washing removes every thing, but a small piece of mercury and gold in amalgam. The gold-washer then lights a piece of cow-dung, upon which he places the amalgam, and (as far as I observed in their manufactories) his labor was repaid by the smallest piece of the precious metal imaginable. The rains are said to be the best and most profitable season: at this period, two rupees per day may be the return of one trough under a gold-washer and one assistant, the worst day's produce about two annas; the gold is either sold to the *buníás* at the large towns in the neighbourhood, or given to zamíndárs for an equivalent.

There is a great loss of particles of the gold in the system of washing adopted here, many of which must pass off through the trough; there is also a total loss of mercury: the latter might be easily reme-

died, we should imagine, were the washers in the habit of giving the amalgam to their employer, who might complete the process in close retorts. It is evident that under the eye of an active and interested person, a trade might be carried on here of a description by no means contemptible: a much greater quantity of the mineral might be procured; and that on the adoption of a trade in the article, an improvement of the apparatus might be effected, tending much to that point. I have much pleasure in sending you three packets.

No. 1, containing the sand as found in the bed of the river.

2, the black powder, the result of the first washing in the trough.

3, the gold ore; and shall hope to see your note on the quality as well as the natural state in which the ore exists: it would appear from the account of the washers that lumps or larger particles than those sent are not found, although it is by no means an easy matter to get correct information on points of this sort*.

That the gold exists in any other shape than that of the present specimen in these lower mountains is very improbable. The particles may differ in size; and we may in all probability detect the stratum containing the gold dust, and so procure it before it has undergone further attrition in the river's bed; but we must look to the Himaláyas themselves for the auriferous strata, from the disintegration of which the sands of these lower hills have been supplied with the mineral. Captain HERBERT alludes to the occurrence of the ore having been traced up to a certain point in one of the tributaries of the Rámgunga, a fact corroborated by Mr. RAVENSHAW of the Civil Service, in a note to the Society. My inquiries establish a similar limit in the Gúmtí river: this is a point, however, that would require very careful examination, and that examination under the eye of an experienced person, who, after all, in such a maze of mountains and rivers, would perhaps have to depend upon chance for successful prosecution of his labors.

The occurrence of gold in alluvial soil is common to every quarter of the globe, although South America and Africa provides the greatest supply of commerce, and in all probability there is no extensive chain of primary mountain that does not charge its drainage with the mineral in question! - Its incorruptible nature, and its not being subject to the

* These have not yet reached us. The black powder is however doubtless similar to that which accompanies the gold dust in the rivers of Assam and Ava:—for the most part magnetic oxide of iron. Platina may also be found in it but rarely. The use of a strong magnet would perhaps prove advantageous, before rubbing in the mercury for amalgamation.—ED.

effects of oxidation from common causes, is a sufficient reason for the presence of this mineral, unaccompanied by others*.

With regard, however, to the Náhun and Rámunga gold, we are perfectly decided on one point, viz. that the rivers bearing the dust have no connection whatever *now* with the great Himaláyan chain, and therefore, that if the mineral exists in abundance at any one point, it will be found in the hills from which these rivers derive their sources; and it is to be hoped, that we may even look forward to the ultimate discovery of gold in comparatively as great abundance as the present fossils, the existence of which, six months ago, would have been as much doubted as the possibility of finding gold now may be.

Northern Duáb, April 10th, 1835.

VI.—*Notice of the Nipálese Spirit Still. By A. CAMPBELL, Esq.
M. D. attached to the Nèpal Residency.*

The accompanying (Pl. XVII.) is a rough sketch of the still in universal use throughout the valley of Nèpál Proper, as well as its neighbouring hilly country; and so far as I can learn in the portions of eastern Thibet, usually visited by Nipálese traders, on the beaten commercial routes, by the Kerún and Kuti passes of the Himálaya, to Digarchi and Lhássa. I believe it to be as different from that commonly used in the plains of India, as it assuredly is from any with which I am acquainted as existing in European countries, and as its use is confined here chiefly to the Newár population, it needs no apology for intrusion on the public attention.

In India, (so far as my recollection is faithful,) Nipálese men, manners, and things are regarded, as pertaining exclusively to the ruling class of the community, yclept Gúrkhás; this arises partly from want of better information on, or curiosity regarding, Nèpál affairs; partly from the common habit of identifying the whole people of a country, with the few, who may for a time direct its destinies, but chiefly from Nèpál being best known to us, as the theatre of a two-years' war between one power and the afore-mentioned tribe.

The Newárs, as is well known, were down to the Gúrkhá conquest the rulers of this valley, and were, as far as at present ascertained, its

* In the specimens from the alluvial soil of the Brazils, the particles of gold are much larger than those found in the Náhun sand, appearing like little boulders, or rounded masses of the mineral. In my cabinet the Brazilian alluvium is clay, or argillaceous matter, with rounded pebbles of white quartz. Mr. MAWE having provided the specimen.

original inhabitants*. At the present time they form the great mass of the agricultural and artisan population, and the ruins of their well-built temples and towns painfully manifest the giving place of their civilization to the rude and barbarian horde of mountaineers who now consume in military idleness the fruits of their fertile fields. Like other tribes of the human race, the Newárs have lost their day of progress, and little remains to them now, save their eminently industrious habits, and a skill in agriculture far exceeding in efficiency that attained and practised in the neighbouring plains of Hindústán.

The fate of the Newárs, and the many good qualities by which they are distinguished, renders all connected with them of much interest. Their original country, previous to their advent in Nèpál, remains as yet undecided. The decidedly Tartarian cast of their physical form, and monosyllabic structure of their language, makes Thibet claim them as her's. The most popular fabulous traditions of the race point to India as the source of their existence, while the religious creed as a means of arriving at a correct knowledge of their origin has, as yet, I believe, proved defective†.

The manners and customs of a people, when known, go far to shew the intimacy of connexion with neighbouring countries; and, I believe, that were those of the Newárs (in such purity as they existed before the Gúrkhá conquest) taken as an index to their original country, few links of close connexion would remain to bind them to India, while many aud strong ones would shew their Bhoteah origin.

The still, then, as an instrument of universal use, supposing it unknown in India, and to be the only one used in neighbouring Thibet, will go for something (trifling enough it is true) in the enumeration of domestic usages; and I now return to it.

The furnace on which the still is represented as resting, while at work, is commonly the clay *chula* of India, or made of unburned bricks. The body of the still (*phúsi*) is of copper, and is seldom made to contain more than 15 or 20 gallons, and costs from 30 to 40 mohurí rupees‡. Over the open mouth of the *phúsi* is placed the portion marked (3) named *putasi*; it is of burned clay, about the same size as the body of the still, and has a circle of round perforations, each the size of a crown-piece, flanking the large opening at its base, as represented in (7) of the sketch. The junction of the *phúsi* and *putasi* being secured by a luting of moist clay, the receiver nam-

* See Mr. HODGSON's paper on the Aborigines of Nèpál Proper, in the Journal of the Asiatic Society, for May, 1834.

† It is calculated that about two-thirds of the Newár population of Nèpál are Buddhists, the remainder Brahminical Hindus.

‡ One mohurí rupee is equal to $12\frac{1}{2}$ annas sicca.

ed *dúbli*, and marked (6) is put into the *putasi*; its base, corresponding in circumference to the large opening in the latter, fills it up completely, and leaves the circle of smaller holes free, for the passage of the spirituous vapour, to ascend into the still head, or *putasi*.

The receiver being placed as above noted, within the portion marked (3), the vessel (5), named *batta*, or condenser of copper, is filled with cold water, and placed over, and into the mouth of the *putasi*, or still-head, fitting so close, as to prevent the escape of any portion of the spirituous vapour from the latter. Thus fitted, the distillation is accomplished, care being taken to remove the condenser so often as is necessary to replace the water become warm, by colder, fit for the condensation of the spirituous steam.

The shape of the condenser suits the performance of its office; the vapour rising through the smaller holes around the receiver comes in contact with its entire surface, and being there condensed, runs towards the apex of it, and thence falls into the sub-incumbent receiver.

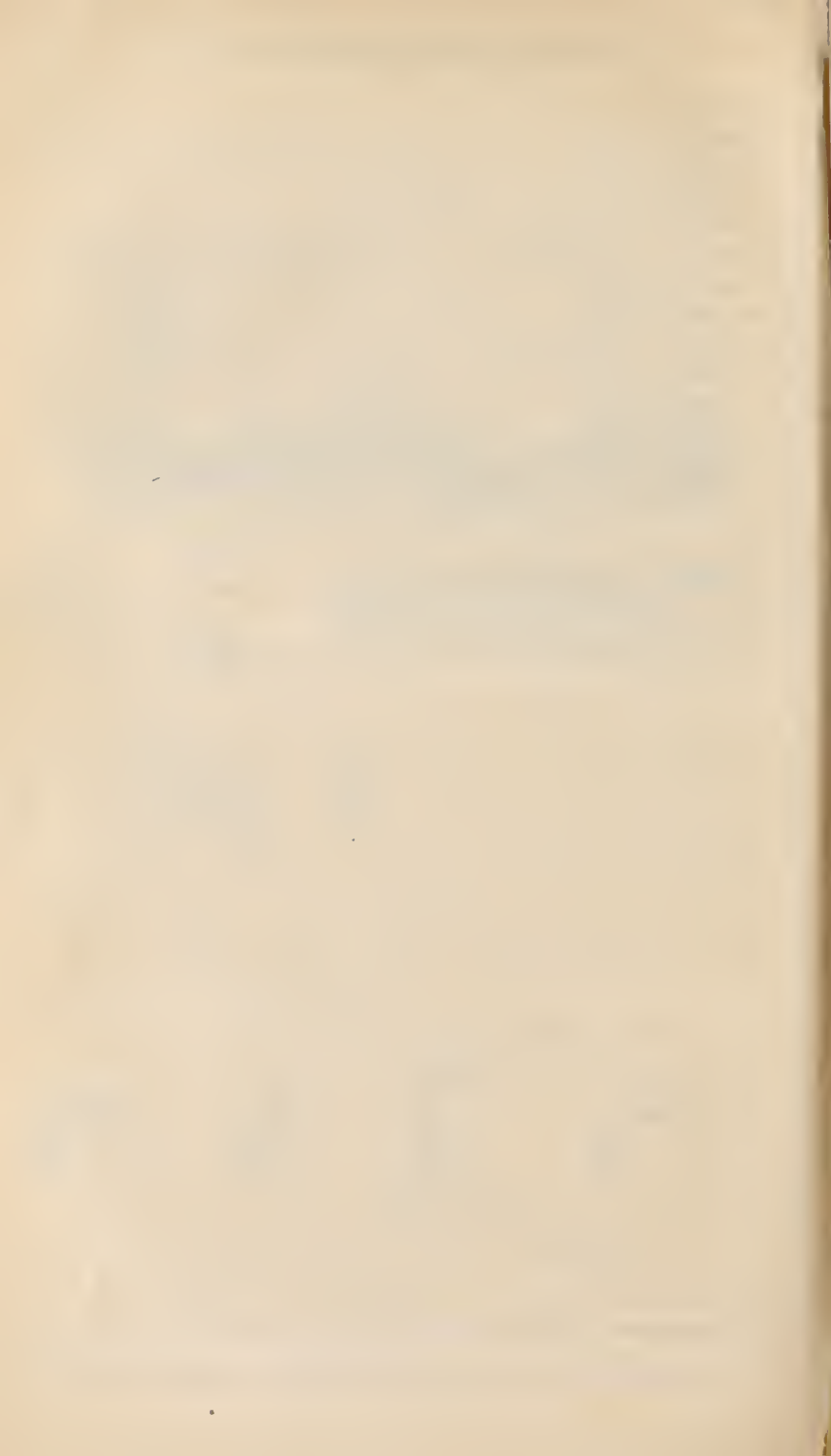
The still is charged, of necessity, previous to the fixing of the receiver and condenser, and these portions are removed at each fresh charge; the receiver being either emptied of its contents and replaced, or a spare one introduced.

At each removal of the condenser there is of course some loss from the escape of vapour, but it is trifling, as there are usually two of these vessels attached to each still, and thus the time occupied in replacing a warm condenser, by a cold, is very inconsiderable.

It must be admitted, that this process is rather rude, and it will be seen, that the construction of the still has not reference to the most approved principles for economising fuel. It is deep and narrow, instead of broad and shallow, yet it is very efficient; and it must be remembered, that the shallow broad still even in Europe is of very modern date, and the result of the severe excise laws, existing in our own, and more civilized countries.

There is one peculiarity in the working of this still, worthy of remark, and the advantages of which in saving fuel compensate in some degree for its rudeness. So soon as the still is in full play, and a portion of vapour has been condensed, and reached the receiver, a fresh distillation commences.

The receiver heated from below causes the spirits to be converted into vapour, which is again condensed, and thus a constant round of distillation is carried on between the receiver and condenser, in addition to the proper distillation of the contents charging the body of the still. Alcohol, at the specific gravity of 863, can be produced from this still, and I have used it with complete success, in making the



spirits of turpentine, and the residuum of yellow resin from the *Ganda Firoza* of Nèpál*, both of these articles, being equally good for medicinal and other purposes, as that to be had in Calcutta, and, I believe, much cheaper.

The ubiquity of this still throughout the valley arises from the freedom of distillation sanctioned by the rulers. Excise laws for whiskey-making are as yet unknown here, and were their executives to appear among the peaceable Newárs, I fear the fate of some of them might resemble that of ROBERT BURN'S man of this craft.

Every Newár, who can afford it, distils his own Rakshi (spirits from rice), and all the lower orders of this people, and many of the respectable ones, are greatly addicted to the use of spirits. They are not by any means given to habitual drunkenness, but they indulge for the good of their healths, regularly and moderately. In the rice-field, cold and wet as it is, the bottle is a great and ever present comfort; while at a religious meeting, or on the celebration of a birth or marriage, it goes merrily and rapidly round; males and females, young and old, alike partaking of it, to the increase of social happiness and joy in all.

Few sights in Nèpál are more grateful to the foreign visitor, than the feasts and merry-makings of the Newárs: on such occasions they congregate on some green and sunny spot, near a temple, or old image, with a running stream of limpid water passing through it, and there, for the live-long day, in the idle seasons of the year, do they sing, play on the musical instruments of their tribe, often dance and ever laugh, enlivened by the *rakshi* stoup it's true; but the main-spring of their joy is the cheerful and happy temperament they possess, to an eminent degree, in strong and pleasing contrast with the sour looks and arrogant demeanour of the Gúrkhás, or the melancholy and apathetic countenances of the inhabitants of Hindústán, who sojourn for a time among them.

Reference to Plate of Still, and its component portions.

Names in Newári language.	English synonyms.
1 Phúsi,	1 Body of still.
2 Sachi,	2 Luting (of clay).
3 Putási,	3 Still-head.
4 Bhúta,	4 Furnace.
5 Batta,	5 Condenser, (copper.)
6 Dubli,	6 Receiver, (earthen.)
7 Putasi, (section of),	7 Section of Still-head.)

* Commonly called Ganda Biroza; it is well known to be the exudation from the denuded trunk of the different species of the pine throughout these mountains.

VII.—Note on an Inscription found near the Kesariah Mound, in Tirhút.

By J. B. ELLIOTT, Esq. (Pl. XVII. fig. 6.)

[In a note to the Editor.]

Having seen mention of the Kesariah Mound made in the last No. of your Journal, I beg to enclose the impression of an inscription cut below the figures of the *Avatárs*, sculptured on a black stone, which I obtained at Kesariah several years ago from a fakír. The figures being small and rudely sculptured, it is not worth while making a copy of them; but as the inscription could not be made out by the Pandit of the Chaphráh Committee, it may be worth deciphering. I visited and made some notes on the subject of the pillars, and other antiquities in Champáran, which I may, perhaps, hereafter communicate.

Note.—This fragment, which is Brahmanical, not Buddhist, is in an ancient form of Dévanagarí, differing little from that noticed on the Bakra image of Mr. STEPHENSON. It breaks off abruptly with an initial *i*:—for it is only to *kírttir iha* that any meaning can be traced: while the diphthong *ai* or *é* is plain over the last letter, which I conclude to be an *h*. The reading in modern Dévanagarí will be as follows: I have added a literal Latin version.

नित्यः श्री चन्द्रदत्तः सूर्यदत्तस्य सूक्ताययादित्याहसमुत्पन्नः कीर्त्तिरिहे

Perpetuus B. ÇANDRADATTUS SU'RYADATTI "Sûkti"-(recitandi)-proprio-tempore-(sc.)-Solis-die-natus. Gloria hic.

The interpretation of which in English will be:—

"The ever-living CHANDRADATTA was born on the Sunday appropriated to the reading of the Sûkta by his father SU'RYADATTA. Glory here." (The Sûkta is the most sacred hymn of the Rig Veda, closing its 3rd Ashtaka or Ogdoad—and has for one of its verses the celebrated Gáyatrí.)

W. H. M.

[NOTE.—I take this opportunity of pointing out, in reference to my observation on the Bakrá image inscription, (page 131,) that I had overlooked a plate in FRANKLIN'S Palibothra, of a Buddhist image, with an inscription, to which Lieut. CUNNINGHAM has since drawn my attention. On turning to it, I perceive, that the two lines separately given are, though miserably perverted by the copyist, precisely the same as the *ye dharmmá hétun*, &c. of Sárnáth. The three lines on the pedestal, though stated in the text to be different, would appear to be the same also; at least the two first words, *ye dharmmá*, are distinct.—J. P.]

VIII.—*Proceedings of the Asiatic Society.**Wednesday Evening, the 3rd June, 1835.*

The Honorable Sir EDWARD RYAN, President, in the chair.

Read the proceedings of the last meeting.

Mr. JOHN RICHARDS, proposed by Mr. BAGSHAW, seconded by Mr. TREVELYAN, was duly elected a member.

Mr. J. P. GRANT was proposed by Mr. TREVELYAN, seconded by Mr. J. COLVIN. Mr. WM. ADAM, proposed by Capt. FORBES, seconded by Mr. HARE. Mr. WM. HY. BENSON, proposed by Dr. MILL, seconded by Mr. PRINSEP. Captain TAYLOR, Madras Cav. proposed by Mr. MACNAGHTEN, seconded by Sir E. RYAN.

Dr. EVANS, Mr. PHAYRE, 7th Regt. Bengal N I., Mr. STOCQUELER, and Lieut. MONTRIOU, Ind. N. were proposed by Dr. PEARSON, and seconded by Mr. J. PRINSEP.

The Secretary brought up the following :

Report of the Committee of Papers on Mr. J. T. PEARSON'S proposition for creating a new order of Members, to be denominated "Associate Members of the Asiatic Society."

1. "We consider Dr. PEARSON'S proposition for creating *Associate Members* to be worthy of adoption by the Society, and we would propose that they should enjoy all the privileges of ordinary members; but we would suggest, that by way of maintaining more than the mere distinction of name between the *Associate* and the *Honorary* Members, some contribution, however trifling, should be required from the former class. The *Associates*, it may be presumed, would be composed of men, whose reputation would not be sufficiently brilliant to admit of their being classed among our *Honorary* Members. They would, in all probability, did their circumstances admit, become ordinary paying members, and the principle upon which the present proposition rests, is, that the Society desirous of removing this obstruction, and encouraging their labours, is willing to admit them on a less expensive footing: at the same time, requiring a moderate contribution to distinguish them from those eminent men, whom it considers an honor to itself, to enrol in its list of members.

2. "Under the above considerations, we concur in recommending that the annual payment of *Associate Members* be fixed at four rupees. Their election to proceed in the mode prescribed for *honorary* members, that is, to be previously submitted to the Committee of Papers for report.

"For the Committee of Papers,

"20th May, 1835.

"J. PRINSEP, *Secy.*"The President, followed by Mr. J. R. COLVIN, proposed that "the first part of the Report be adopted, "That there should be *Associate Members*, having all the privileges of ordinary members."

Mr. D. ROSS, seconded by Mr. MCFARLAN, moved as an amendment, that the words "with the exception of any power of voting on money questions" be added. This amendment was lost, as was another proposed by Mr. N. B. E. BAILLIE, seconded by Capt. FORBES, "that they should have all the privileges of ordinary members, except the right of voting."

The motion was then put and carried; the second proposal was also made into a resolution, viz. "That *Associate Members* shall pay an annual contribution of four rupees."

The Secretary submitted also the—

Report of the Committee of Papers, on Mr. GARDNER'S application and estimate for Repairing the Monument of Sir WILLIAM JONES.

"The Committee find on inquiry that the repairs may be executed at an expence of about 150 rupees.

"They trust the members will be unanimous in thinking it desirable, to evince the respect of the Society for the memory of its illustrious founder, by authoriz-

ing the trifling expence which will be required to repair his monument, and to preserve from obliteration that beautiful epitaph which he wrote for himself, and which is so characteristic of the independent uprightness and the unaffected piety of its author.

“ For the Committee of Papers,

“ 20th May, 1835.

“ J. PRINSEP, *Secy.*”

Proposed by the Rev. Dr. MILL, Vice-President, seconded by Mr. COLVIN, and resolved, that the Report of the Committee be adopted and acted upon.

The draft of a Memorial to Government, regarding Oriental Publications, prepared by a Special Committee, appointed at the last meeting, was then read by the President, taking the sense of the meeting on each paragraph. The following is the Memorial, as finally adopted :

To the Hon'ble Sir C. T. METCALFE, Bart. Gov. General of India in Council, &c. &c. &c.

Honorable Sir and Sirs,

The Members of the Asiatic Society, now resident in Calcutta, have requested me, as President of their body, to address the Honorable the Governor General in Council, on a subject which engages their deepest interest.

2.—It has come to the knowledge of the Society that the funds which have been hitherto in part applied to the revival and improvement of the literature and the encouragement of the learned natives of India, are henceforth to be exclusively appropriated to purposes of English education.

3.—The Asiatic Society does not presume for a moment to doubt the power of the Government to apply its funds in such manner as it may deem to be most consistent with the intentions of the legislature, and most advantageous for the great object of educating its Indian subjects ; but they contemplate with the most sincere alarm the effect that such a measure might produce on the literature and languages of the country, which it had been hitherto an object both with the Government and with the Education Committee, under its orders, to encourage and patronize, unless the proposition which they have the honor to submit, meet with the favorable attention of Government.

4.—The Society has been informed, that this departure from the course hitherto pursued has been ordered to take such immediate effect, that the printing of several valuable oriental works has been suddenly suspended, while they were in different stages of progress through the press ; and that the suspension has been alike extended to the legendary lore of the East, and to the enlightened science of the West, if clothed in an Asiatic language.

5.—The cause of this entire change of system has been, the Society understand, a desire to extend the benefits of English instruction more widely among the natives of India ; the fund hitherto appropriated to that purpose not being deemed sufficient.

6.—The Members of the Society are individually and collectively warm advocates for the diffusion, as far as possible, of English arts, sciences, and literature ; but they cannot see the necessity, in the pursuit of this favorite object, of abandoning the cultivation of the ancient and beautiful languages of the East.

7.—The peculiar objects of the Asiatic Society, and the success with which its members have, under the auspices of their illustrious founder, prosecuted their researches into the hidden stores of oriental knowledge, entitle them to form an opinion of the value of these ancient tongues, intimately connected as they are with the history, the habits, the languages, and the institutions of the people ; and it is this which emboldens them

to step forward on such an occasion as the present to offer an humble but earnest prayer, that the encouragement and support of the British Government may not be withdrawn from the languages and literature of the vast and varied population, whom Providence has committed to its protection.

8.—Many arguments of policy and humanity might be advanced in support of their present solicitation, upon which the Society do not deem it within their province to expatiate. There is one argument, however, which appears to be of so conclusive a character as to require distinct notice in this Appeal.

9.—It is admitted by all, even the most enthusiastic advocates of the English system of tuition, that this language never can become the language of the great body of the people whose moral and intellectual improvement is the benevolent object of the British Government. It is moreover admitted, that the Sanscrit language, while it is directly the parent of the dialects spoken from Cashmere to the Kistna, and from the Indus to the Brahmaputra, is also the source from which every other dialect of the Peninsula, and even many languages of the neighbouring countries, have been for ages dependent for every term extending beyond the merest purposes of animal or savage life. If it were possible to dry up this source of literary vegetation, which gives beauty and fertility to the dialects of India in proportion to the copiousness of its admixture; the vernacular languages would become so barren and impoverished, as to be wholly unfit to be the channels of elegant literature or useful knowledge. The same may be said of Arabic and Persian as regards the Hindustáni language.

10.—The Society are far from meaning to assert that the withdrawal of the support of Government, from the cherished languages of the natives of India, would put an end to the cultivation of them. On the contrary, they think that the natural and necessary effect would be that both the Hindus and Muhammedans would, in that event, adhere with tenfold tenacity to those depositaries of all they hold sacred and valuable. But, incalculable mischief, in a variety of shapes, would nevertheless be effected. If the British Government set the example of neglecting oriental studies, it can hardly be expected that many of their European subjects will cultivate them. The field will then be left in the undisturbed possession of those whose unprofitable husbandry is already but too visible, and who will pursue it with a view to the perpetuation of superstition and defective morality among the people. An influence will thus be lost, the benefit of which to the more intellectual classes of natives can scarcely be estimated too highly, arising from the direction given to their studies and pursuits by those who can freely acknowledge what is intellectually and morally valuable in their previous systems, and distinguish it from what is of an opposite character: and who take the first and most necessary step for removing the wrong prejudices of others, by proving that they are without unjust prejudice themselves. It needs no laboured proof to shew how infinitely more powerful must be our protest against what is demoralizing or debasing in the native institutions, when we act with this knowledge and this spirit, than if we commenced by repudiating every thing Asiatic, as contemptible, and acknowledged no basis of intellectual communication with them, but what was formed in the peculiar fashions of modern Europe.

11.—If the Sanscrit and Arabic languages, consecrated as they are by ages of the remotest antiquity—enshrined, as they are, in the affections of venerating millions—the theme, as they are, of the wonder and of the admiration of all the learned nations of Europe;—if these languages are to receive no support from a Government which has been ever famed for its liberality and its justice,—from a Government which draws an annual revenue of twenty millions from the people by whom these languages are held sacred, it is the decided opinion of the Asiatic Society—an opinion which they want words

to express with adequate force, that the cause of civilization and the character of the British nation will alike sustain irreparable injury.

12.—The Society, therefore, earnestly beseech the Honorable the Governor General in Council, that if, on full consideration, any reasonable doubt shall be entertained by the Supreme Government of the right of the native literature to a fair proportion of the sum appropriated by Parliament, “for the revival and improvement of literature, and for the encouragement of learned natives of India,” he will then be pleased either himself to grant, or if necessary, to solicit from the Court of Directors, some specific pecuniary aid to be annually expended on these objects. And the Society will be happy to undertake the duty of superintending the expenditure of this sum, under such checks as it may please the Government to impose.

13.—But whatever may be the determination of the Government on this point, the Society respectfully intreat the Governor General in Council, that he will be pleased to afford to them the assistance of the learned natives hitherto employed in these literary undertakings, together with such pecuniary aid as may be necessary, to complete the printing of the oriental works, which has been interrupted by the resolution of Government to direct the funds hitherto expended upon them to purposes of English education.

14.—Should Government be pleased to accede to this request, the Society will furnish with as little delay as possible an estimate of the amount which will be required for the attainment of this object.

15.—The Society cannot doubt that the Governor General in Council will support their appeal to the home authorities with his powerful advocacy, nor that the earliest opportunity will be taken of bringing the merits of the important and entirely national question it embraces, before the Honorable the Court of Directors, in all its bearings. This address has been dictated solely by the desire of proffering to Government the services of an appropriate organ, through which the publication of the oriental classics may be continued, and that further patronage extended to oriental studies, which it cannot believe the Government to have any intention of altogether abandoning.

EDWARD RYAN, *President.*

*Asiatic Society's Apartments, }
June 3rd, 1835.*

Upon the first five paragraphs one or two verbal alterations only were suggested. On the 6th, which originally ended, “but they would deeply regret if, in the pursuit of this favorite object, it were thought necessary or advisable to abandon, &c.”

Mr. COLVIN begged to propose the omission of the word “favorite,” as applied in the above paragraph of the Address to the object of extending the means of English education. It appeared to him to convey an unnecessary imputation, as if of prejudiced favoritism or partiality. He would here say (alluding to some remarks which had passed in conversation), that he entertained as cordial a desire, as any one could do, to promote the literary purposes, with a view to which the Society was formed. He, as a member of the Society, fully sympathized in the feeling which would seek to maintain the knowledge and cultivation of the oriental languages and literature, and he would readily join in an address to Government to obtain its patronage and pecuniary support for those studies; but he had hoped that the proceedings of the evening were to be free from controversy. He had not been present at the meeting of the previous month, but he had seen with great gratification, that the proposition then adopted was for the preparation of a memorial, “which should avoid to the utmost all controversial points.” He feared from the observations which had been made that he should be disappointed in this respect. He had, however, been unintentionally led, by what had passed, into a digression; returning to the object for which he had risen to speak, he proposed the omission of the word “favorite” in the passage which had just been read.

Mr. W. H. MACNAGHTEN could not help expressing his astonishment, at the observations which had been made by the gentleman who had just sat down. He had hoped that in this place at least, oriental literature would have found protection and favor: that, however ruthlessly and successfully the opposition to this cause might have manifested itself in other quarters; here, at least, no enemy would be permitted to enter under the garb of a votary, and that this sanctuary of science might not be polluted by any unhallowed voice. Now he was tempted to exclaim, *Procul, O procul este profani!* When he heard a gentleman coming forward with such an objection as has been made, he could not help ascribing it to something more than a dislike to the epithet. What expression could possibly have been used more innocent or more appropriate? Here was the fact before them, that the funds dedicated to oriental literature had been entirely carried off; that works of all descriptions, scientific as well as others, had been strangled in the very act of coming into the world, and thrown aside as useless and pernicious; and after all this, when they said that the authors of this to them grievous calamity were actuated by another *favorite* object, they were taken to task for the expression. He really wanted words to express his surprise at such a frivolous objection being urged, and he trusted the Society would evince the same sense of it as he entertained, that it was wholly unworthy of being attended to.

Mr. COLVIN's proposition was not seconded.

Mr. PRINSEP, thought that the terms 'deeply regret' were not nearly strong enough to show the sentiments of the Society—he would suggest '*cannot see the necessity*' as more appropriate.

This expression after some discussion was substituted.

On the perusal of the 12th paragraph, which stood originally as follows:

"The Society therefore earnestly beseech the Honorable the Governor General in Council, that *he will be pleased to solicit pecuniary aid from the Court of Directors, to be annually appropriated to the revival of the oriental literature, and the encouragement of learned natives*, and the Society will be happy to undertake the superintendence, &c."

Mr. H. T. PRINSEP moved as an amendment, that the sentence be altered, (as it now stands in the memorial,) to convey a stronger expression of the Society's feeling on the recent measure.

Mr. COLVIN said, that he must oppose the amendment. He took the liberty of again addressing the meeting, as he was desirous to record his opinion on the question which had now been brought under discussion. He would not enter into an argument on the point of law which had been mooted. He had himself always considered, and still considered, the orders of the Government to be fully consistent both with the terms and the spirit of the act of Parliament. He must think it difficult to believe, that the legislature, in the first, and only specific appropriation which it had made with a view to the mental advancement of the Indian people, had intended not to entrust to the Government, to which it has committed the immediate control of these territories, the discretion of applying the fund as it might judge most expedient and practicable, in order to the cultivation of the most improved literature, and the communication of the most enlightened systems of knowledge, which its subjects might be found willing to receive at its hands. It appeared to him a strange conclusion, that it had been meant by the British Parliament to render compulsory the maintenance of a system calculated to perpetuate the ignorance and prejudices of the people—that it had been designed to fetter this Government and to restrain it from measures of improvement. But he had said, that he would not go into a discussion of the point of law. He would rather state what he considered to be the duty of the Society in regard to the address which was now to be presented. Was it proper, he would ask,—was it respectful, in going up to Government as applicants for its assistance, that they should assert, by implication, that it had, in its late measure, deviated from its proper course? Was that a subject which the Society ought to entertain at all? Further, he would urge that it would certainly be most disadvantageous for their own purpose, were they, in appealing to the liberality of

Government, to express in any manner disapprobation of its proceedings. Looking only to the motive of securing the success of the application which they were about to make, he would say, omit in the address all and every topic of controversy. The Government, in receiving an address such as was now proposed, would appear called upon to vote its own condemnation. He would, on these grounds, give his voice against the amendment.

Mr. MACNAGHTEN again rose, and spoke to the following effect :

Mr. PRESIDENT, we have been assured by Mr. COLVIN more than once, that he is no lawyer. He could not have asserted with equal truth, that he is no preacher, for he has favoured us with a very lengthy discourse on our duties, both to the Government and the people. But I must take the liberty of differing with him altogether, as to the doctrines he has propounded. We are an independent, and I trust, a respectable body, congregated for the purpose of promoting by every means in our power the cause of literature and science. As the guardians of that sacred cause, it is not only our privilege, but our duty to appeal, respectfully it is true, but earnestly, to that power which is competent to rescue it from impending danger. I would go further and say, that if the Government could be so infatuated as to declare open hostility against the languages and literature of the people of India, it would be an obligation, of which we could not divest ourselves without disgrace, to remonstrate against such a proceeding with all our energies. If we think we have the law as well as the justice of the case on our side, no liberal, no equitable Government would be offended by our pointing it out.—Mr. COLVIN has again returned to the ground which he first took up, and has indulged in the use of slighting and contemptuous language as applied to oriental studies. He has moreover asserted, that such sentiments are entertained by the natives themselves. Gentlemen, I have now been resident in this country upwards of twenty-six years, and, I believe, I may say, that I have not been deficient in my attention to the genius of the people, their languages, their literature, their habits, or their prejudices, and I will venture to affirm, that nothing can be more without foundation than the supposition which Mr. COLVIN appears to entertain. Oriental literature has much to recommend it, and the natives of the country are passionately devoted to that literature. It cannot be otherwise. I cannot sit down without again expressing my astonishment, that this place should have been selected for such an attack. If havoc and desolation rage around us, we may not be able to prevent it; but here in the citadel of our strength, that an effort at our overthrow should be made, is to me astonishing. I have no fear, however, that it will be successful, or that there will be difference of opinion as to the character of the proceeding.

The PRESIDENT, however unwilling to offer an opinion from the chair, must object to the amendment, because it appeared to entertain a doubt of the legality of the course pursued. Government acted by advice, and there remained an appeal to the proper tribunals if any interest were aggrieved. He was anxious to impress on the Society the necessity of abstaining from legal and political discussions, as quite out of character in a literary and scientific institution. Otherwise they must lose many members who could not vote, nay, could not sit, where such topics were to be canvassed. The case was strong enough of itself; the application for continuing the suspended oriental publications was a most proper object for the Society to urge; it should have his warmest support, provided it were unmixed with other matters which had been the subject of discussion elsewhere, and upon which the Government had expressed their opinion. He had a very strong opinion on the necessity of excluding debatable topics of this nature from the Society, and if they were to continue such discussions he for one should be compelled to retire. Literary and Scientific subjects seemed to him the only matters proper for discussion with them, except the little usual business which must of course be disposed of.

Mr. MACNAGHTEN, with the most unfeigned deference and respect to the learned President, must take leave to express his doubts, as to the doctrine which he had delivered, or at all events to seek for some explanation which might solve his difficulties. He understood from him, that in this place, they were never competent to touch upon a question of law, and that if they did, those who are connected with

the legal profession must cease to be members of the Society. This doctrine seemed to him to involve the necessity of submitting to every species of spoliation. Moreover that they were not competent to advert in any way to the measures of Government. Now it appeared to him, that they were not here as lawyers or as civil or military servants of the Company; and that when they met in this hall, they divested themselves of those characters, and appeared only in the character of the servants of science and of literature, the guardians of oriental learning, and the representatives of its interests both in Asia and in Europe. In that sacred character they were bound to be vigilant and active. Indeed, he could conceive cases involving questions of law, in which they should feel themselves compelled to act. Supposing the Government were to be advised that they held a mortgage in the Society's premises, and that upon this hint, they were to proceed *instantly* to an ejection. Ought they in such a case tamely to resign their right, because there happened to be lawyers among them? He could understand the motive which should restrain particular gentlemen from expressing an opinion, but he could not conceive any circumstance which would justify their surrendering without a struggle the rights of their constituents. Those constituents are, he said, the literary men of all nations. They had an awful trust imposed upon them, and they must execute it faithfully and conscientiously as a great public body, without any personal motives, or any personal scruples.

Mr. PRINSEP felt great diffidence in expressing his dissent from what had fallen from the President, the more so, as he was himself a most unworthy member, whereas the President's merits towards the Society were of the highest character. But he could not think, under British Government, any society, or even any individual could have the least hesitation in expressing respectfully an opinion, that the Government had misconstrued a law, when that misconstruction was likely to do injury to the rights or the feelings of so large a portion of its subjects as the native community formed in this country. No wilful error or wrong was imputed to the Government: but surely it was not too much to say, as he was confident was the case, that Government had in this instance been ill-advised and misled. He did not speak as a lawyer, but as a member of this Society, whose position in respect to the literature of India had been well described by Mr. MACNAGHTEN. That there could be no possible offence to Government in so expressing themselves he felt assured, by seeing members and high officers of the Government ready to join in so doing. He was somewhat surprised at what had fallen from Mr. COLVIN, as to the ancient literature of India, being calculated only to perpetuate idolatry and superstition. What would be thought, if England had possessed herself of Greece, a part of which was under her dominion, and had bestowed funds for reviving its language and literature,—would any one be listened to who should urge, that with the language of Greece one would be reviving her mythology? The most advantageous thing for the advancement of European literature in India was to revive that of the country, and place them in contrast side by side: it was easy to see which must then prevail. He did not think the Society should take so humble a tone as to ask, as a charity, that which Parliament had given as a right, and would rather not succeed in the object that all had equally at heart, than take it in the shape of an eleemosynary donation.

Mr. H. T. PRINSEP quoted the words of the act, which he believed had been grounded on a minute of Mr. H. COLERIDGE's, specially pointed to the literature and learned natives of the country. He thought there could be no doubt as to the meaning of the clause, and if such were entertained by any present, he should not hesitate to take the votes of members as to the construction to be put upon the words. Entertaining this opinion, he thought the Society ought to have no hesitation about expressing it; and as for the fact stated, that the Government had put a different interpretation upon the law, he knew not how the Society could know that these questions had ever been determined by the Government. But even if this point had been so ruled, that was no reason why the members of this Society, if their opinion was clear as to the legal rights of this literature, of which they were the patrons and protectors, should not express that opinion even to the Government. He was quite sure it was the general feeling, that the grant was made by Parliament to the literature of India, which ought not to be robbed of

the provision so made to it. By the amendment, it was intended to express this as delicately and respectfully as possible.

Sir J. P. GRANT thought it right to state, that in voting for the amendment, he did not mean to give an opinion upon the question of law. He did not think that the amendment went to express any opinion upon the question of law, and if it did, most certainly he neither would nor ought to vote upon it. It merely, in his opinion, asked of the Government to give its consideration to the question, and in case they should be of opinion that oriental literature had not a legal and parliamentary claim under the words of the act, then to make a new and specific grant of funds for this important purpose.

Mr. W. GRANT was not disposed to blink the question which the Society wished to bring under the reconsideration of Government, and did not see that any disrespect was implied in urging, however strongly, such reconsideration. The Society had for a long time believed, that a particular fund was appropriated by Parliament to objects in a manner confided by the public to the Society's peculiar care, and they now learned that this fund was no longer to be so applied. The Society was bound to undertake the cause of oriental literature, and to urge Government to reconsider a resolution so inimical to it. And if upon serious reconsideration, Government should continue to be of opinion, that no fund was by law appropriated at present to its conservation, then to urge an application to the proper quarters for a fund which should be so appropriated.

Mr. COLVIN asked Sir J. P. GRANT, whether the words of the amendment which he read did not at least by implication convey an opinion upon the question of law.

Sir J. P. GRANT said, that in his opinion they did not, but that the words in the Act of Parliament being such as they had that night been stated to be, the amendment suggested to the Government, that it was a grave question, of which it desired their reconsideration, and upon this view he was prepared to vote for the amendment; but the suggestion being made that it might be otherwise interpreted, he should not vote.

The amendment was then put and carried. The revised memorial was once more read through, and, on the motion of Mr. H. T. PRINSEP, seconded by Bábu RASUMAY DUTT, it was adopted *nem. con.*

Read a letter from Captain WADE, enclosing one from the Chevalier VENTURA, acknowledging his election as an honorary member.

Read extract of a letter from Lieut. A. BURNES, enclosing copies of desiderata in Botany from Professor GRAHAM, and in Geology from the London Society.

Read a letter from THOMAS DICKENSON, Esq. Secretary to the Bombay branch of the Royal Asiatic Society, acknowledging the receipt of M. CSOMA's Tibetan Dictionary and Grammar, and expressing the best thanks of that Society for the same.

Library.

Read a letter from EDWARD T. BENNETT, Esq. Secretary to the Zoological Society of London, forwarding its proceedings for the years 1830, 31, 32, and 33, with the 2nd part of the 1st volume of their Transactions, for presentation to the Society.

Read a letter received through M. L. A. RICHY, from Monsieur GARCIN DE TASSY, forwarding for presentation copy of a work entitled "*Les Œuvres De Walí, (Dewán-Walí,)*" recently published by himself in Hindustani at the royal press of Paris.

The Indian Journal of Medical Science, No. 18, was presented by the Editors.

Meteorological Register for April, 1835, by the Surveyor General.

The following books were received from the book-sellers.

Lardner's Cabinet Cyclopædia—Simson's Roman Empire, vol. 2nd.

_____, Germanic Empire, vol. 1st.

Library of Useful Knowledge—Natural Philosophy, vol. 3rd.

A List of the Pali, Burmese, and Singalese works, in the Burmese character, (some with Burmese interpretations) in the Asiatic Society's library, was submitted, and ordered to be printed in the out-coming catalogue.

Museum and Antiquities.

A model of the Táj Mahal at Agra, in ivory, was presented on the part of Messrs. W. CARR and J. PRINSEP.

A note from the Baron Von HUGEL, on the variance of the Tope at Sár-náth, from the Dehgopas of Ceylon, was read.

[This will find a place in a future number.]

A letter from Col. S. P. STACY announced, that he had despatched for the inspection of the Society, to the charge of their Secretary, his very extensive collection of Bactrian, Indo-Scythic, ancient Hindu, and Muhammedan coins, of which he also forwarded a detailed catalogue.

This collection is more than usually valuable from its having been made principally in central India, and it is mainly rich in Hindu coins, of which it will serve to devolope many series with names hitherto unknown.

Physical.

Specimens of Copper Ore from the Ajmír mines, with a descriptive account by Captain DIXON, addressed to the Governor General, were presented through Captain SMYTH, Mil. Sec. G. G.

An account of the bearded vulture of Nipal, *Gypætos barbatus*, by Mr. B. H. HODGSON, was submitted, with an accurate painting by his native artist.

Mr. HODGSON is in possession of upwards of 2000 illustrations of the Fauna, and the Ornithology of the valley, which he is now seeking to publish in a worthy manner, in conjunction with eminent naturalists at home. The plates and descriptions of the Mammalia are already gone to England, and the others will soon follow. The whole will form a memorable monument of his zeal and indefatigable industry.

Extracts of a letter from Professor WILSON were read.

The Ashmolean Society, is anxious to obtain through the Asiatic Society, an entire skeleton of an alligator, for the purpose of perpetual comparison with the fossils of the Saurian tribe at home. An inquiry has arisen which can be solved only in this country, Do Elephants shed their tusks? The immense supply of them brought from Africa to England, if derived from the death or destruction of the animal, must it is thought soon lead to its extermination.

[Mr. WILSON, has, we are happy to remark, prepared the *Vishnu Parána*, the *Sankhya Chandrika*, for the press, and only waits the casting of a new fount of type. The Hindu theatre has passed through a new edition. MOORCROFT's Journals are still in MURRAY's hands, and the bust not commenced upon, by CHANTREY.]

Notice on the foetus of the basking shark (*squalus maximus*), and a preserved specimen, were submitted by Dr. J. T. PEARSON

A paper was submitted by Mr. F. G. TAYLOR, H. C. Astronomer at Madras, on a new method of ascertaining the error of collimation in astronomical instruments by reflection from a surface of the mercury.

[This very valuable and simple method is described in the present number.]

A note on the mummy brought by Captain ARCHBOLD from Egypt was submitted by Dr. EVANS.

From the lateness of the hour the reading of the papers presented was postponed to the next meeting.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of May, 1835.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of May, 1835.

Day of the Month.	Observations at 10 A. M.										Observations at 4 P. M.										Register Thermometer Extremes.		Wind.		Weather.	
	Standard Barometer at 32°.	Wet Barometer, do.	Ags. Ten. deducted.	Ther. in air.	T. or M. T. Depress.	Leslie's diff.	Hygrom.	Hair Hygrometer.	Standard Bar. at 32°.	Wet Bar. at do.	Ags. Ten. deducted.	Thermometer in air.	Different.	Leslie's diff.	Hygrom.	Hair Hygrometer.	Cold on roof.	Heat in sun.	Rain.	Morning.	10 A. M.	Evening.	Morning.	10 A. M.	Evening.	
1	29.806	29.506	1.300	86.3	8.4	8.1	89	81	670	234	436	89.8	13.8	13.5	75.0	75.0	..	..	..	..	S	w.	w.	fair.	cumuli.
2	29.780	29.458	1.322	87.1	7.3	7.0	91	80	664	198	466	91.5	11.6	11.3	82.0	82.0	..	..	..	..	se.	sw.	sw.	fine.	do
3	29.763	29.421	1.342	87.0	8.0	8.0	89	80	635	156	480	91.4	11.1	11.2	83.	83.	..	..	..	..	ne.	sw.	sw.	do	do
4	29.742	29.401	1.327	87.5	8.0	8.0	89	80	635	156	480	91.4	11.1	11.2	83.	83.	..	..	..	..	o.	sw.	sw.	light clds.	hazy sky.
5	29.757	29.470	1.327	87.9	8.7	8.8	90	80	675	200	475	91.0	14.1	14.5	76.	76.	..	..	..	..	o.	sw.	sw.	clear.	fine.
6	29.782	29.456	1.326	87.5	11.3	10.8	84	84	671	287	384	90.8	13.4	13.2	80.	80.	..	..	..	..	se.	sw.	se.	cloudy.	hazy.
7	29.770	29.461	1.323	88.9	9.1	8.4	89	81	671	308	273	86.5	7.4	8.6	89.	89.	..	..	..	..	se.	sw.	se.	clds. and mist	dull.
8	29.784	29.471	1.323	87.5	7.1	6.7	93	80	680	356	324	87.9	7.8	8.6	89.	89.	74.8	115.8	0.75	..	E.	se.	se.	do	overcast.	
9	29.784	29.490	1.294	87.3	7.2	6.8	92	80	679	322	347	88.3	3.3	4.1	99.	99.	73.5	105.0	1.75	..	E.	se.	sw.	hazy.	cumuli.	
10	29.776	29.491	1.293	87.9	4.7	4.7	99	89	678	436	242	83.4	3.3	4.1	99.	99.	73.0	81.5	12.00	..	SE.	se.	se.	very hd. rn.	and night.	
11	29.718	29.576	1.142	83.3	3.6	3.2	99	89	623	369	163	83.5	4.6	4.5	98.	98.	73.0	81.5	12.00	..	SE.	se.	se.	sd.th. lgt. rn.	cloudy.	
12	29.642	29.538	1.104	81.7	3.6	3.2	99	89	523	369	176	83.5	4.6	4.5	98.	98.	72.0	98.2	..	..	o.	sw.	sw.	overcast.	gathering.
13	29.592	29.480	1.112	82.0	3.0	3.0	99	89	496	322	176	84.1	5.6	5.4	96.	96.	74.0	106.8	..	..	nw.	sw.	sw.	rain.	hazy c.c.
14	29.682	29.424	1.198	84.3	5.6	5.3	95	83	438	348	195	85.3	9.1	9.1	89.	89.	74.7	126.2	..	..	nw.	sw.	sw.	gathg. clds.	circ. cumuli.
15	29.609	29.480	1.200	83.1	5.2	5.4	98	84	546	141	405	89.4	5.6	5.7	96.	96.	76.4	110.1	..	..	s.	sw.	se.	fog.	circ. cumuli.
16	29.594	29.484	1.110	83.8	5.2	5.4	96	84	486	147	389	88.6	5.6	5.7	96.	96.	73.5	102.5	..	..	s.	sw.	se.	scud cumuli.	cumuli.
17	29.530	29.433	1.097	85.8	5.1	5.3	97	84	486	147	389	88.6	5.6	5.7	96.	96.	81.5	109.5	..	..	S.	sw.	se.	do	fair.
18	29.497	29.433	1.064	86.5	5.1	5.3	97	84	486	147	389	88.6	5.6	5.7	96.	96.	80.3	117.0	..	..	S.	sw.	se.	hazy.	do
19	29.536	29.440	1.096	86.5	5.6	5.9	95	83	554	181	373	90.3	7.9	7.3	92.	92.	81.0	101.6	1.15	..	SE.	sw.	se.	cloudy.	cum. hazy.	
20	29.734	29.418	1.316	87.7	5.4	5.7	95	83	554	181	373	90.3	7.2	7.0	93.	93.	71.1	108.6	..	..	o.	ne.	se.	hazy.	gathering.
21	29.712	29.370	1.342	86.0	8.4	8.8	88	86	506	162	424	90.3	9.2	8.6	88.	88.	74.5	116.6	..	..	ne.	sw.	sw.	clear.	fine.
22	29.644	29.346	1.348	86.3	5.7	5.8	95	83	500	126	454	91.0	9.4	9.1	88.	88.	79.1	113.0	..	..	se.	sw.	sw.	do	do
23	29.734	29.406	1.328	87.9	7.0	7.2	93	83	635	196	438	90.8	10.8	10.5	84.	84.	73.0	110.1	..	..	SE.	sw.	sw.	cum. cirri.	hazy.
24	29.750	29.406	1.328	87.0	6.7	6.9	93	83	630	196	438	90.8	10.8	10.5	84.	84.	79.8	103.6	..	..	SE.	sw.	sw.	overcast.	cloudy.
25	29.668	29.313	1.315	86.9	6.7	6.9	93	83	486	118	368	91.7	8.1	7.9	91.	91.	80.3	103.6	..	..	S.	sw.	sw.	cumuli.	do
26	29.602	29.316	1.316	86.9	6.3	6.6	94	82	596	106	432	90.8	7.4	7.7	91.	91.	72.2	111.6	0.65	..	S.	sw.	sw.	do	do	
27	29.637	29.424	1.263	87.0	6.0	6.5	92	87	576	218	353	89.2	7.8	7.1	89.	89.	77.2	114.8	..	..	E.	ne.	se.	overcast.	hazy.
28	29.649	29.510	1.350	88.3	5.7	5.7	95	87	519	114	405	90.2	8.3	8.2	88.	88.	77.0	122.5	..	..	E.	ne.	n.	cumuli.	do
29	29.609	29.404	1.264	88.2	7.8	7.4	90	80	456	120	336	81.9	5.7	7.0	91.	91.	76.8	133.0	0.10	..	ne.	ne.	se.	cumuli.	do	
30	29.583	29.416	1.287	87.6	7.0	4.2	93	83	456	230	266	87.1	4.1	6.3	95.	95.	76.8	133.0	..	..	ne.	ne.	ne.	do	stratus nim.
31	29.585	29.416	1.287	87.6	7.0	4.2	93	83	456	230	266	87.1	4.1	6.3	95.	95.	77.0	118.9	0.65	..	n.	N.	o.	slight rain.	showery.	
Mean	29.603	29.360	1.293	86.8	6.3	6.3	93	83	577	206	1.368	88.3	7.5	7.6	90	90	76.4	108.7	15.85	..	southerly.	..	..	..	rain early, and very heavy.

The Barometer registered on Sundays is a different instrument, but it agrees with the other within .01 inch, the thermometer accompanying it shews a much lower temperature in the dwelling house than at the Mint, where the heat given is that of an open laboratory.

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